VOLUME 2 NUMBER 9 SEPTEMBER 1995

OS/2® MAGAZINE

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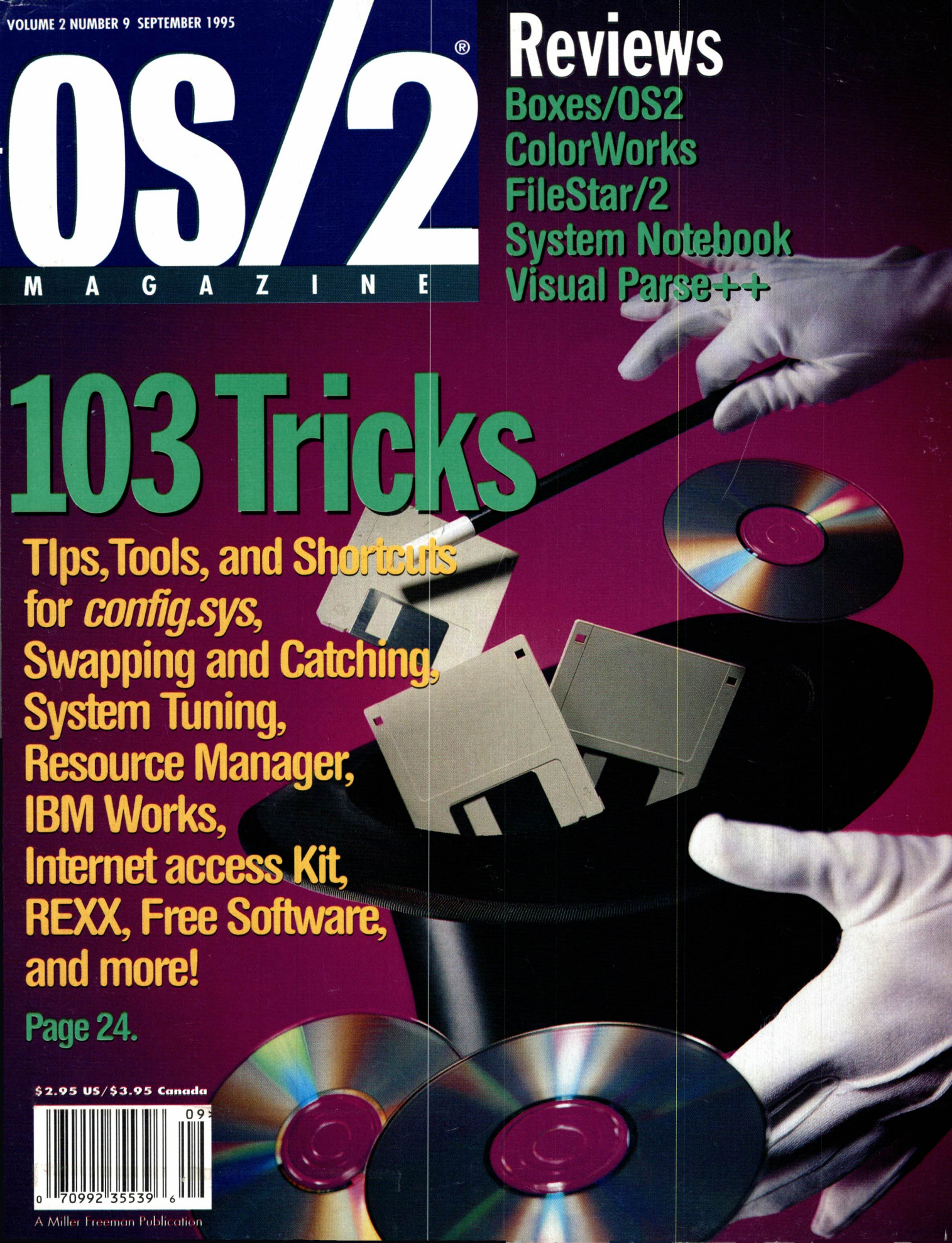

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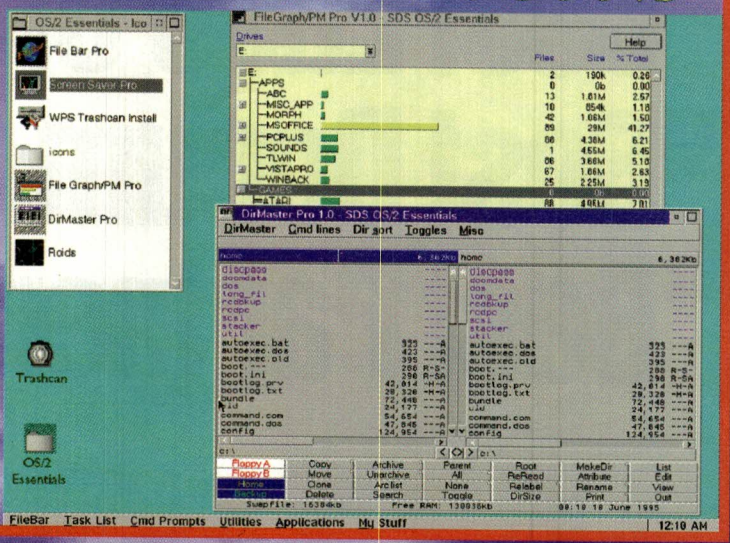

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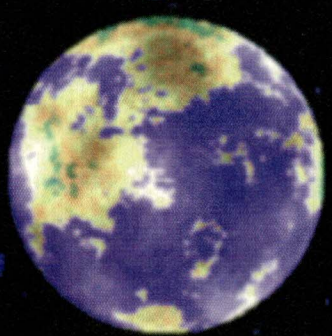

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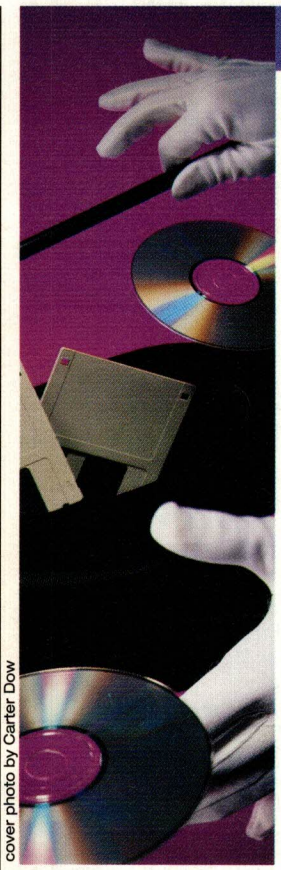

cover photo by Carter Dow

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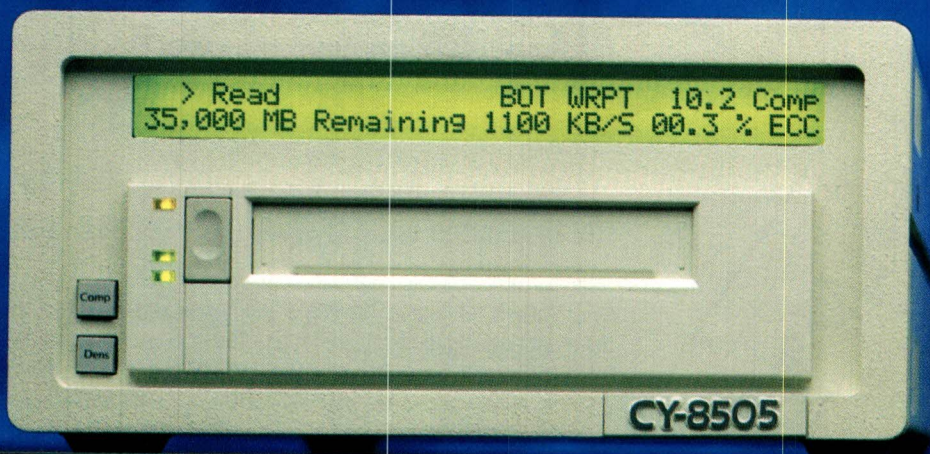

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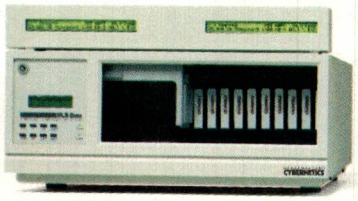

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Perspectives

The Lotus Position

As I write this editorial, the big news story is IBM's acquisition of Lotus Development Corp. OS/2 users have long had a love/hate affair with Lotus, lauding it as the only major third-party OS/2 software developer, but whining about its fickleness. If Lotus is serious about OS/2, they ask, why does SmartSuite for Windows ($299 minus $40 rebate) have more and better applications than SmartSuite for OS/2 ($299, no rebate)? Where are OS/2 versions of Approach, cc:Mail Mobile, Organizer, and ScreenCam? Why won't Lotus roll out its 32-bit upgrades, which use a common code base for OS/2 and 32-bit Windows, until Windows 95 ships? And so on....

According to IBM's chairman and CEO Lou Gerstner, the initially hostile acquisition is all about Notes, Lotus's category-defining groupware tool, not about OS/2. Notes is the sort of product that plays to IBM's strengths: It can be sold by a direct-sales force, it can act as a multiple-platform "glue" to bind IBM systems together, and there's lots of opportunity to sell premium-priced consulting and support services. (For more about Notes, see "The Network Connection," p. 55.)

IBM will offer Notes more opportunity to grow and evolve than Lotus alone could provide. In return, IBM management is betting that Notes will vault IBM into a leadership position in PC software—a position that's long eluded the world's largest software company.

At his press conference discussing IBM's acquisition plans, Mr. Gerstner's statements were widely interpreted to hurt OS/2's cause. He said, "This acquisition has absolutely nothing to do with OS/2" and "OS/2 is one of our operating systems." Hearing this, business and computer-industry journalists cheerfully declared that OS/2 is dead. (Of course, those same reporters interpreted the 1994 Republican electoral landslide, the Sakhalin Island earthquake, and the renewal of the Nuclear Non-Proliferation Treaty each to mean that OS/2 is dead.) On the other hand, other analysts (including *OS/2 Magazine* columnist Will Zachmann, p. 15) see the deal as a reaffirmation of IBM's commitment to OS/2.

Neither camp hits the mark. I believe that—as Mr. Gerstner stated—the $64-a-share deal is about Notes, although picking up a few applications, a patent portfolio, and experienced programmers certainly helps justify the price. If OS/2 figured into the equation, it was in only the most cursory way.

Be that as it may, the new "IBM Lotus Division" (or whatever it's called) will clearly have *some* effect on OS/2. Let's look at some potential helpful and harmful implications:

Helpful: Nothing beats OS/2 as a Notes Server platform. If IBM aggressively promotes OS/2 as a key component of "the Notes solution"—perhaps with heavily discounted server-and-clients software bundles—Notes could act as a springboard for OS/2's success.

Harmful: Although OS/2 is the preferred Notes operating system, the software also runs under Macintosh, NetWare, UNIX, Windows, and Windows NT. If IBM forces Lotus to drop or de-emphasize these platforms, Notes will die. IBM didn't spend 3.5 gigabucks to kill Notes. But if IBM continues improving the 32-bit Windows versions of Notes, IBM's public commitment to OS/2 is undermined.

Helpful: With IBM's funding, Lotus's major applications (Notes, 1-2-3, cc:Mail, and AmiPro) might evolve into best-selling business standards competitive with Microsoft's Office. Although the first battles will be fought in the Windows market, the availability of identical versions of these applications on both platforms can ease corporate migration to OS/2.

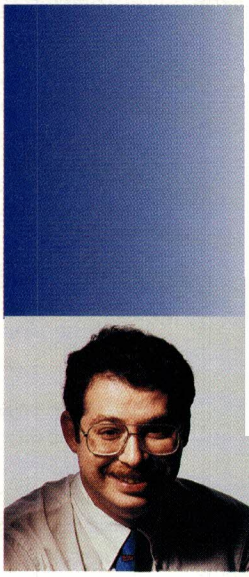
Harmful: IBM has an $11 billion software business—the largest in the world. Despite this, IBM's track record in developing and selling PC applications is worse than dismal. Remember the IBM Desktop Software division, shut down in 1991 after three years of operation? This killed or maimed several well-regarded products, including Current, Hollywood, Platinum, Storyboard Live, and the almost-finished Signature word processor. Let's hope this isn't *déjà vu* all over again.

Helpful: Gaining access to Lotus's distribution channel and expertise in shrink-wrapped software should help IBM sell its existing desktop applications, as well as Lotus software. (IBM should begin selling its own PC software under the Lotus brand name, which is one of the hidden assets of the acquisition.)

Harmful: Lotus's software-distribution muscle is due to its Windows products, which make up the bulk of its revenue. Lotus has also poured millions into revamping those products (particularly Word Pro, as AmiPro is now called) for Windows 95. To keep that channel open, recoup that investment, and take market-share away from Microsoft Office, IBM will have to aggressively promote and sell Windows 95 applications *that won't run under OS/2*. Again, this will visibly contradict IBM's stated commitment to OS/2.

Helpful: The "IBM Lotus Division" might be ordered to release OS/2 versions of all its desktop products—and ensure that they're at the same functional level. This would give OS/2 a family of true flagship applications, the same way Windows has Microsoft Office as a flagship.

Harmful: Since IBM took over marketing SmartSuite for OS/2 in mid-1994, the product has virtually dropped from sight—so we already know where it fits



in the IBM hierarchy. If IBM is interested only in Notes, and continues to ignore SmartSuite, those highly visible OS/2 applications could stagnate or disappear. A rusted, unseaworthy flagship will only embarrass the OS/2 community.

Helpful: If IBM continues to drop the ball on SmartSuite for OS/2, developers of competing spreadsheet, presentation-graphics, electronic mail, and word processing products would divvy up Lotus's former customers between them. If the business applications officially die, a feeding frenzy might also encourage new developers to stick their toes in the OS/2 water.

Harmful: Many third-party developers enjoy close links with IBM's OS/2 development team. However, developers whose products compete against Lotus offerings might be reluctant to share proprietary business or technical information with IBM. Worse, they might find themselves classified as "competitors," locked out of IBM's technical briefings, developer subsidies, and cooperative marketing programs.

Helpful: Although it's no longer King of the Mountain, IBM is still a very high-volume PC manufacturer. If the PC Company preloads SmartSuite onto all of its systems instead of Microsoft Office, that's instant market share. IBM can also undoubtedly make more attractive preloading deals to other hardware makers than Lotus could.

Harmful: It took years before IBM bundled its own PC DOS onto its own hardware, because the PC Company preferred to load Microsoft's MS-DOS. Are we confident that IBM has learned from that experience?

Helpful: IBM's directors are still sitting on a huge pile of cash. Perhaps they'll invest that money in OS/2 software development, using the Lotus team to spearhead the push.

Harmful: Maybe they won't. Mr. Gerstner has many problems within IBM to address, such as the continued difficulties within the PC Company. He must have a l-o-n-g shopping list of things to buy, to fix, and to launch, and developing new OS/2 software can't be high on that list. It's my guess that we've seen the last major investment in desktop software until Lotus returns some of its huge investment to IBM's shareholders.

It's far too early to tell how much, or how little, the Lotus acquisition will mean to the OS/2 community. It could be IBM's smartest move yet. It might be irrelevant. It might be harmful.

Much depends on the degree of autonomy given to the "IBM Lotus Division." Too much emphasis on short-term profits will force Lotus—like the IBM PC Company—to focus on the huge Windows installed base. Drastic cutbacks in development, marketing, and sales staff will destroy Lotus's chances to be competitive. I'd hate to see the traditionally risk-averse Big Blue management style bring Lotus to its knees.

The next turning point in the Lotus-IBM story will be this time next year, when the acquisition is complete, we see who's running the show at Lotus, we learn what IBM's priorities really are, and bits of the future Lotus strategy begin to emerge.

Alan Zeichick
Editor-in-Chief

Splat! There goes another masterpiece. It was going to be a work of art, a monument to elegance and flexibility. It was going to be your finest creation. What happened? It got beaten into unrecognisable garbage by some clumsy GUI builder. And the controls ended up as subtle as a flying sledgehammer thanks to a resource editor with an attitude.

It's enough to turn a decent living programmer into a serial killer. Somebody out there had better come up with a solution.

We just did. It's called Prominare, a professional's programming tool for GUI creation that has all the answers. Take a look at the code it generates. It's exactly the way you would have written it yourself. Define your naming convention and Prominare will stick to it to the letter.

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To create custom controls, use Prominare as the resource editor and you'll have enough options to give you total freedom. It will also handle all major object libraries, PEN and multimedia. It handles all versions of OS/2 and understands your old resources or Windows resources as well.

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Now here's the best bit. A shareware version called Prominare Lite is freely available on the Internet. Help yourself to it and see how it beats the stink out of anything else.

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Letters

"IBM tried to let the ISV world have it all when OS/2 first shipped."

IBM and ISVs

Dear Editor:

I have a difference of opinion with comments that were made in "Dateline: OS/2" (July 1995, p.11). IBM tried to let the ISV world have it all when OS/2 first shipped, but nothing worthwhile happened, except that Microsoft took the opportunity to take advantage of the sleeping giant. IBM must provide good applications that put OS/2 into production mode right out of the box. They don't have to be "killer apps" that would put ISVs out of business, but something that makes the system truly usable. The Internet tools that are provided are only a start, but they are necessary to attract interest to the product. The NetSuite line of FTP, Gopher, and News Reader are prime examples of better products that people will pay for if they frequently use preloaded applications. If IBM didn't include this software, users would still have next to nothing to run on OS/2 after loading the system.

Tom Lynch

I don't argue the value of the BonusPak and any other free applications that IBM provides with OS/2 Warp. I do see, however, that people in the OS/2 community (both vendors and users) are unclear about what to expect from IBM in the way of free software.

How would you feel if you had purchased a piece of software for $100 only to find that the more comprehensive update was included free of charge with an upgrade of OS/2? Or, if you were hoping to make a living writing a fax package for OS/2 and, before you finished, IBM started giving away a competing product for free, would you continue to work on new OS/2 projects?

I'm not suggesting that IBM stop enhancing its operating systems' offerings with free software, but they need to tell people what they're up to before they do it. The fact that no one, including IBM, knows the status of future versions of Internet Access Kit applications, except for the WebExplorer, shows they have a long way to go.

—Alexander Antoniades

Lotus and OS/2

Dear Editor:

I just read Yuko Takagi's letter ("Letters," June 1995, p. 9) that she wrote in response to Alexander Antoniades' "Dateline: OS/2" column (June 1995, p. 9). I found her letter truly frightening. If you read between the lines, Takagi is clearly saying that the upcoming 32-bit Lotus products are WordPerfect-type products. That is, they are written for Windows, but will also run—sort of—under OS/2.

This approach is perfectly consistent with Lotus's past style of support for OS/2. 1-2-3 for OS/2 is such a poor performer that I had to take it off my system and replace it with Excel. AmiPro for OS/2 is an unfinished product and, although I prefer its automated style sheet metaphor, I had to replace it with Word because you cannot do tasks as simple as printing an envelope in Portrait mode. What Takagi does not seem to realize is that the longer this situation is allowed to drag on, the less inclined I—or anyone else—will be to switch to the Lotus products when and if they ever come out.

Bill Kraengel

As we understood Lotus' stragedy with regard to the development of their new OS/2 products, the contention is that by using the new developer extension tools (see "Dateline: OS/2," August 1995, p. 11), Lotus will use a common code base for their applications so the OS/2 and Windows versions of the same applications should (finally) be comparable in both features and performance.

—Alexander Antoniades

PowerQuest responds

Dear Editor:

We wanted to respond to a couple of criticisms that Brian Proffit made in his review of our product, PartitionMagic (July 1995, p.17). Brian pointed out that he had to manually update Boot Manager when he moved a partition. We have recently released version 1.03, a maintenance release that fixes this problem. Now, PartitionMagic automatically updates Boot Manager when you move a partition.

He also expressed some reservations about the pricing, with which we agree. We discovered, shortly after shipping PartitionMagic, that the $129.95 price was not serving the market very well. Professionals who configure machines for a living thought it was too cheap and end users who have the perception that it is a one-use product thought it was too expensive.

To address the pricing problem, we have created two licenses for PartitionMagic. The professional license permits use of PartitionMagic on an unlimited number of machines as long as the product is used on one machine at a time. This license sells for $795 and includes free support and automatic maintenance releases for one year. We are currently conducting a market test to determine the price for a personal license that will allow the user to install PartitionMagic on up to two separate machines.

John Christensen
Vice President of Marketing
PowerQuest Corp.

Errata

In "Just Announced" in the July 1995 issue (p. 51), the wrong phone number and e-mail address were listed for SoftPaw Development. The correct telephone and fax number for SoftPaw Development is (404) 998-2193 and their e-mail address is *74654.1725 @compuserve.com.*

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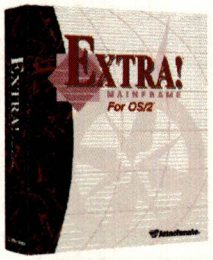

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IBM Buys Lotus

IS THIS A NEW LEASE ON LIFE FOR A MAJOR OS/2 ISV?

BY ALEXANDER ANTONIADES

What does $3.5 billion buy these days? Well, for IBM it buys a chance to regain dominance of the PC industry—founded by IBM in 1981—that slipped out of its grasp. Because, for $3.5 billion, IBM acquired Lotus Development Corp. and hopefully a new lease on life in the PC software business.

While the rumors of a major IBM acquisition had been circulating for months, the opening salvo wasn't fired until June 5, 1995, when IBM chairman and CEO Lou Gerstner announced that IBM was launching a hostile takeover of Lotus. The initial offering was a $3.3 billion dollar bid at $60 per share.

The next week, Lotus's stock doubled in price as speculators tried to make a quick profit on the deal, and as Lotus CEO Jim Manzi vowed to fight IBM's takeover. It all ended on June 11th, when the Lotus board of directors approved the offer for the final price of $64/share ($3.5 billion dollars).

Lotus development

Lotus was founded in 1982 when its initial success was based on the 1-2-3 spreadsheet for DOS. In 1986, with almost all of the PC spreadsheet market in his pocket, Lotus founder Mitch Kapor turned over the reins to CEO Jim Manzi. During the next nine years, Manzi led an aggressive attempt to build Lotus into more than a spreadsheet company. Most of the growth was fueled by acquisition. The current portfolio of products includes a spreadsheet (1-2-3), word processor (AmiPro, now Word Pro), presentation package (Freelance Graphics), database (Approach), personal information manager (Organizer), mail program (cc:Mail), and screen-capture tool (ScreenCam). But, undeniably, the crown jewel for the past two years has been Lotus' groupware product, Notes.

Notes has evolved into the linchpin of Lotus's strategy over the past couple of years, thanks to its status as the dominant package for implementing groupware. Most analysts agree that, despite some vaporware products from Microsoft and other players, Notes will remain the leader in the groupware market. Some projections call for Notes to reach $1 billion by itself by 1998.

However, Notes hasn't been enough to make Lotus successful. Although the latest incarnation of SmartSuite (currently in beta) has received good reviews, it is seriously lagging behind Microsoft's Office and Novell's PerfectOffice in the Windows application suite wars. Before IBM intervened, Lotus was reeling after reporting a quarterly loss to shareholders.

The future

Some analysts have predicted that, with the purchase of Lotus, IBM will adopt a more Notes-centric strategy and move away from desktop operating systems (meaning dump OS/2). This might seem likely to people who are not familiar with the OS/2 marketplace, but we believe, based on the amount of money IBM continues to invest in OS/2, that IBM is still committed to the operating system.

Another concern about OS/2 was IBM's relationships with its OS/2 ISVs. These relationships have appeared to be tremendously problematic on the outside, because a few vocal third-party providers have been complaining loudly to everyone who will listen. Most OS/2 software vendors, however, seem to be taking IBM's new status in stride. Dave Pollak, president of Athena Designs, whose Mesa/2 spreadsheet competes directly with 1-2-3, points out that IBM has been selling the SmartSuite for OS/2 for some time and the fact that they're officially the same company now doesn't really make much of a difference. For better or for worse, most OS/2 software vendors have already learned how to work around IBM.

What's more precarious is the future of IBM's own internal projects. IBM Workgroup, for example, is a program to take a group of old IBM software (such as the e-mail package, UltiMail and the scheduling package, Time and Place/2) and meld them into a cross-platform set of applications that will provide the glue for OpenDoc and OS/2. Now that IBM has Lotus's applications, it is unclear how many of the IBM-originated pieces of Workgroup will be replaced by Lotus components—or, if Workgroup will be continued at all.

And, what about StarOffice? IBM licensed the rights to the English-language versions of the StarOffice applications suite from a German company called Star Division. These applications, currently in beta, include a word processor, database, spreadsheet, charting tool, imaging tool, and document manager. IBM has been saying that StarOffice will find its way to America in some form or another over the next year, but after buying Lotus, why would IBM want to market two office suites for OS/2—one of which is only licensed?

Ultimately, Lotus is just another weapon in IBM's arsenal. IBM's problems in the PC industry aren't a lack of good software, but no notion of what to do with good software. Until that problem is solved, acquisitions won't help this $65 billion company achieve the leadership role it so clearly wants.

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Late-Breaking Developments in the World of OS/2

Just Announced

UniMaint 4.0

Uninstaller for OS/2

SofTouch Systems is announcing the release of the first uninstallation utility for OS/2. UniMaint can access desktop *.ini* files in addition to the extended attributes of files. Programs can be removed by dropping them onto a special desktop object. Other features include a Desktop Backup/Restore facility, the ability to create and use a "portable" backup of the Desktop, and the ability to change global Workplace Shell settings. UniMaint 4.0 has a retail price of $89. Call SofTouch Systems at (800) 944-3028, (405) 947-8085, fax (405) 632-6537, or e-mail *mnorton@ionet.net.*

READER SERVICE NO. 151

Unite CD Maker

First OS/2-only CD-ROM burner

Cirrus Technology is announcing the release of one of the first CD-ROM mastering packages for OS/2. Unite CD Maker uses Workplace Shell drag-and-drop techniques to create CD-ROMs. Hardware support includes CD-Recorders from Sony, Yamaha, and Kodak. Unite CD Maker is priced at $249. Contact Cirrus Technology at (800) 272-1135, (301) 698-1900, or fax (301) 698-1909.

READER SERVICE NO. 152

LinkWiz 1.0

PC-to-PC transfer utility

PCX Software is announcing the release of a new file-transfer utility for OS/2. LinkWiz transfers files between two PCs, using the included cables that connect through parallel or serial ports. The software runs on OS/2, Windows, and DOS so files can be transferred to and from non-OS/2 machines. LinkWiz is priced at $149. Contact PCX at (619) 259-6300, fax (619) 481-6474, or e-mail *70216.174 @compuserve.com.*

READER SERVICE NO. 153

Clearlook 1.5

Word processor update

Clearlook Corp. is announcing an update to their OS/2 word processor, Clearlook. Version 1.5 offers several new features, including WordPerfect 6.0 and AmiPro filters, better style definitions, document and window size defaults, and expanded file listings. It has a suggested retail price of $169. You can upgrade from previous versions free of charge by downloading from Clearlook's BBS: (309) 764-0082. Contact Clearlook at (309) 764-2060 or fax (309) 764-2086.

READER SERVICE NO. 154

PowerChute Pro for OS/2

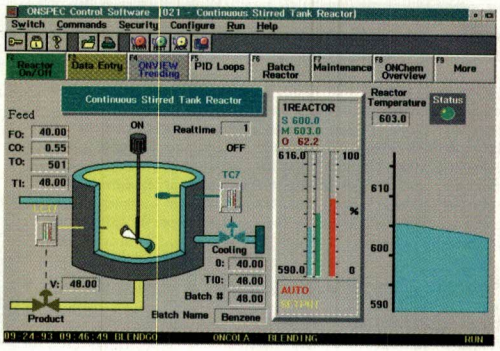
UPS software

American Power Conversion is releasing an OS/2 version of the software that controls their Back-UPS and Smart-UPS line of uninterruptable power supplies. PowerChute Pro for OS/2 can diagnose the status of the UPS, schedule shutdowns on a regular basis, and automatically shutdown before battery power has expired. It also creates an event log for tracking activity. PowerChute Pro is bundled with the Back-UPS Pro and Smart-UPS VS lines of UPSs. Software can be purchased independently of the units at $99. Contact American Power Conversion at (401) 798-5735 or fax (401) 789-3710.

READER SERVICE NO. 155

OnSPEC 32 MMI

New low-end automation tool



OnSpec Automation is announcing an automation tool for OS/2. OnSpec 32 MMI provides SCADA (automation process monitoring and control) for up to 5,000 points on a system. This product interfaces with various data-acquisition devices, including Allen Bradley, Modicon, and IBM DCC2-compliant devices. Linking is supported to other OnSpec products, including add-on modules for statistical process control, formula management, scheduling, and instruction and procedure management. Pricing for OnSpec 32 MMI starts at $2,995. Contact OnSpec at (800) 939-0439, (916) 939-0262, fax (916) 939-0290, or e-mail *76244.170@compuserve.com.*

READER SERVICE NO. 156

Just Announced

Late-Breaking Developments in the World of OS/2

Secure Workplace 3.0

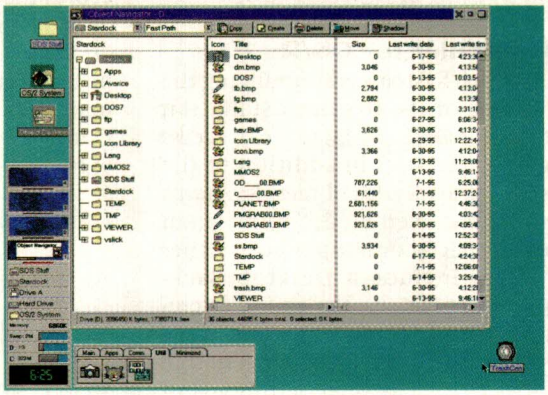
OS/2 desktop security

Syntegration is releasing an update to their OS/2 Security product. Secure Workplace allows for more control of the Workplace Shell and includes some desktop management utilities. Version 3.0 has some new features, such as the ability to lock any object in the Workplace Shell, user identification, and auditing facilities. Secure Workplace is priced at $59.95. A 10-license version is available for $549. Upgrades from previous versions of Secure Workplace are available for $25 directly from Syntegration. Contact Syntegration at (909) 464-9450, fax (909) 627-3541, or e-mail *73707.3331@compuserve.com*.

READER SERVICE NO. 157

Object Desktop 1.0

Give the Workplace Shell a face lift



Stardock Systems is releasing a Workplace Shell enhancement product for OS/2. Object Desktop adds new functions, changing the look of the Workplace Shell. Features include Object Archive, for manipulating *.zip*, *.lzh*, and *.zoo* files as folders, HyperDrive, a file viewer, and HyperCache, for faster access to Workplace Shell folders. You can also use it to replace the open and close buttons on all windows and add new arrows to the scroll bars. Object Desktop has a retail price of $99. Contact Stardock Systems at (313) 453-0328, fax (313) 453-1480, or e-mail *wardell@ibm.net*.

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Relish v.2.12...Winner of 1994 OS/2 Magazine's Editor's Choice Award! Flexible scheduling functions combine with the Workplace Shell drag-and-drop environment for ease and convenience. Relish's intuitive approach to personal calendaring is grounded in a multi-tasking, multi-threaded design. Combine that with drag-and-drop enhancements, time-saving features, and extensive flexibility to manage time and tasks with ease.

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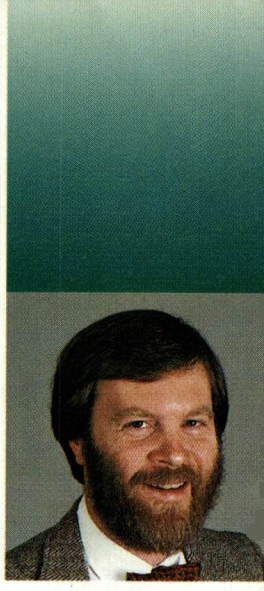


Why IBM bought Lotus

WHERE LOTUS FITS INTO IBM STRATEGY.

BY WILL F. ZACHMANN

When, on June 5, 1995, IBM first announced its intention of acquiring Lotus Development Corp., no mention was made of OS/2 Warp. The topic came up only in response to a direct question to IBM chairman and CEO Lou Gerstner: "How important is the Lotus applications suite to OS/2?" Gerstner replied: "This acquisition has absolutely nothing to do with OS/2. OS/2 is one of our operating systems, and we have a strategy for OS/2. We want to have the Lotus platform operate independent of all or in conjunction with all operating systems. And so everybody's operating systems—those inside IBM, those outside IBM—will be treated the same in terms of the Lotus platform."

The OS/2 hand wringers (who sometimes consider themselves, contrary to fact, to be OS/2's only true supporters) and those who want to encourage as much OS/2 hand wringing as possible (who are, in fact, OS/2's sworn enemies) lost no time in proclaiming (yet again) that this statement meant that Gerstner and IBM aren't actually committed to OS/2 after all. They rushed to quote Gerstner's diffident phrase, "OS/2 is one of our operating systems," trying to convince everyone that the Lotus acquisition does not bode well for OS/2.

Don't believe it. That is total nonsense. IBM's acquisition of Lotus is not only very good news for OS/2, but, notwithstanding Gerstner's disingenuous reply, IBM's acquisition of Lotus most certainly has quite a lot to do with OS/2. To be sure, OS/2 isn't the only—or even necessarily the primary reason behind IBM's move to acquire Lotus. It is equally certain, however, that it is one of the reasons—and a very important one at that. To understand why, however, we must examine all of IBM's significant reasons for acquiring Lotus and see how OS/2 fits into IBM's bigger picture.

IBM chose to emphasize certain reasons for moving to acquire Lotus, which, although real enough, don't tell the whole story. First among these reasons is Lotus's Notes product, upon which nearly all efforts to define groupware as a general category are based. Notes has not only created a new category of software, but it has done so with spectacular success. Notes is clearly the hottest and most successful new product in enterprise computing and is undoubtedly a primary reason for why IBM wants Lotus.

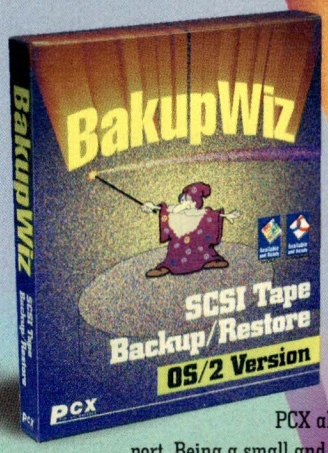
While not as important as Notes, Lotus's excellent (and related) cc:Mail product was also specifically mentioned by Lou Gerstner at the time the acquisition was first disclosed. Lotus's cc:Mail nicely complements Notes and IBM's older PROFS-based mainframe products.

A third reason that was specifically mentioned by IBM from day one was Lotus's established third-party distribution network to sell horizontal "shrink-wrap" personal computer software through distributors and dealers. Historically, IBM has not been as successful as they would have liked in personal computer software sales. Gerstner made it clear that he looked to Lotus to provide the expertise in such distribution, which IBM has previously lacked.

A fourth reason for the acquisition, mentioned but relatively downplayed by Gerstner, is Lotus's established SmartSuite of personal computer applications. The acquisition of this asset represents the point of departure between reasons given by IBM for acquiring Lotus and the actual reasons why IBM is acquiring Lotus. However, Lou Gerstner and his colleagues at IBM prefer to de-emphasize or even to avoid discussing the subject entirely—at least for the present.

Important as Notes might be, IBM would not be willing to pay $3.5 billion cash for Lotus, if Notes was all Lotus had to offer. Notes total sales to date are reported at no more than a couple-hundred-million dollars—a mere fraction of the acquisition price. Despite Lotus's recent loss of market share in applications, primarily to Microsoft, standard PC applications remain Lotus's primary revenue source. These applications also happen to be very good and very competitive with Microsoft's offerings. Chances are good that with IBM's financial resources behind it, Lotus can mount a very successful counter-offensive to take back, with Lotus SmartSuite, much of the ground that was lost to Microsoft Office over the past couple of years.

IBM/Lotus has an excellent chance of regaining that market share by offering very aggressive prices for SmartSuite and the Lotus applications—not only directly, but by way of system OEM preloads. Microsoft will likely face the choice of having to respond by lowering prices on MS applications or accept substantial loss of what is only recently gained market share. Lotus alone could not afford to cut prices sharply on desktop applications, as Lotus depends too much on revenue from such applications short term. With IBM's deep pockets, however, Lotus can pursue a long-term strategy to regain market share and, in the process, deprive



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PortaTape™ is your complete portable tape backup solution for OS/2. Using high speed SCSI tape devices, the PortaTape line offers capacities ranging from 250 megabytes to 10 gigabytes. Offering backup speeds from 6 to over 18 megabytes per minute when using a high speed, bidirectional printer port, units in the PortaTape series are priced from $995.

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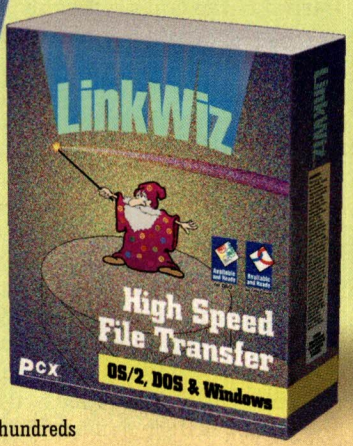
LinkWiz™



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Microsoft of revenue.

Two other reasons for the acquisition—one which was barely mentioned and the other which remains unmentioned by IBM—are the Lotus personnel and patents that are gained. Personnel to be gained includes such key innovators as Notes "godfather" Ray Ozzie, as well as many Lotus programmers and marketers whose skills and experience IBM very much wants to obtain. At least part of the acquisition cost might just as well be thought of as a personnel recruiting fee for IBM.

Lotus's patents, including groupware patents that Lotus acquired along with Ozzie's Iris Associates and Notes, also add substantially to IBM's already well-stocked software patent arsenal. And, because of the way IBM structured the acquisition, they might even be able to circumvent requirements of the prior IBM Consent Decree to license IBM patents and deprive competitors, such as Microsoft, of rights to those Lotus/Iris patents—although sufficient information is not yet available to know that for sure.

IBM's most deeply hidden agenda in the Lotus acquisition, however, concerns IBM's battle with Microsoft to define future software standards. One major objective of the acquisition clearly is to ensure that Lotus will be aligned 100 percent with IBM in that battle. Two aspects of that alignment include OpenDoc and OS/2 Warp.

IBM has worked very hard over the past couple of years behind the scenes to get Lotus to fully commit to OpenDoc over OLE 2.0 and to give priority to the timely development of OS/2 Warp versions of Lotus SmartSuite applications. Results have been mixed—at best. Despite public commitments to OpenDoc and to OS/2 Warp, ongoing foot dragging by Lotus has made it clear that the company's commitment to OpenDoc and OS/2 Warp was lukewarm, at best. That will certainly change now that IBM owns Lotus.

IBM would not, in my opinion, have moved to acquire Lotus if Jim Manzi and Lotus had actually gotten behind OS/2 Warp and OpenDoc as they said they would. Notwithstanding IBM's claims to the contrary, both OS/2 Warp and OpenDoc have a great deal to do with why IBM decided to buy Lotus—it is the only way IBM can be assured that Lotus will be fully aligned with IBM's strategic imperative to wrest control of microcomputer platform standards from Microsoft.

The outcome will not only be that Lotus's commitment to OpenDoc is assured, but that OS/2 Warp versions of Lotus SmartSuite applications will get the resources they need to ensure that they are every bit as good and every bit as timely as are their Windows versions. That's very good news for OS/2 and for OS/2 users. Don't let anyone bamboozle you into believing otherwise!

Will Zachmann, a well-known computer-industry analyst, is the founder and president of Canopus Research, based in Duxbury, Mass. He is also a former vice-president for corporate research of International Data Corp. You can reach him on CompuServe at 76004,3657, or on his popular CANOPUS forum.

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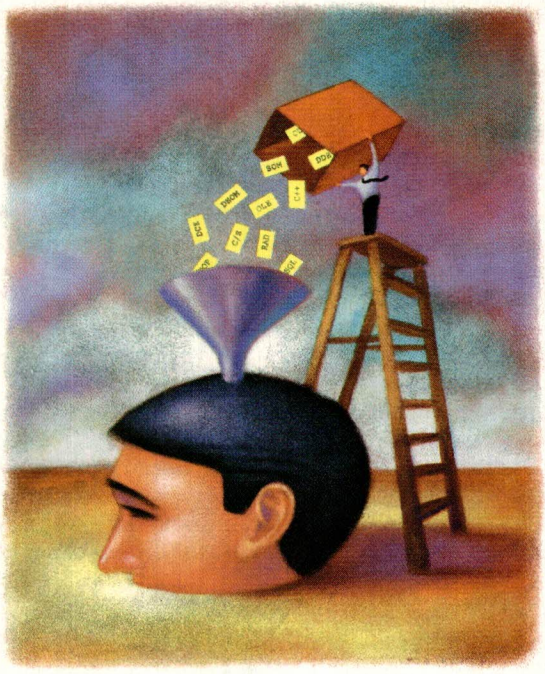

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Parsed System Boxes

BOXER/OS2, SYSTEM NOTEBOOK, AND VISUAL PARSE++.

BY BRIAN PROFFIT

BOXER/OS2 7.0

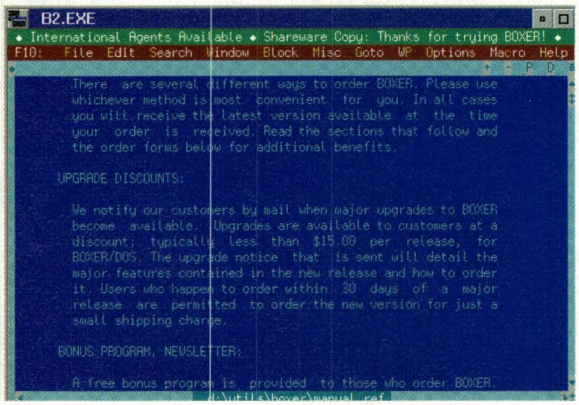
Some people say that all of our modern conveniences have made us lazy. Perhaps so, but how many of us would willingly go back to the days without electricity and all the simplicity it brought us? Boxer is a member of a group of "gas light" text editors in an electrified world. Microsoft is dropping the development of MS-DOS, and while IBM will continue PC DOS for a while, not many people are spending money on character-based applications over their simpler graphical counterparts for Windows and OS/2.

The opposite of GUI is CBUI

Boxer is deeply rooted in the full-screen character-based tradition. As such, its interface is entirely non-standard and brings a new learning curve to those who are more accustomed to other interfaces, such as the Workplace Shell. It is a port of a DOS program, which shows in several ways. For example, during installation you are asked what printer you have. That's so Boxer can let you embed printer control codes in your files. Embedding printer control characters is the only way you can perform such functions as advancing the printer to a new page. But for OS/2, that should have been done using the standard OS/2 interfaces so you get the proper effect no matter what printer you are using. The only OS/2 exploitation I could detect was the support of HPFS filenames and the general lack of restrictions, such as the number of files that can be open at one time, which would be limited by real memory under DOS.

The installation program then asks what screen background color you want. Remember that it is a character-based product that runs in a command session—windowed or full-screen. As a result, it isn't aware of the colors you have established for the Workplace Shell and it doesn't accept colors that you drag from the color or scheme palettes. (An interesting side note: The colors that are offered are monochrome, black, blue, brown, cyan, green, red, white, and. . . Windows. Oh, well.)

On the other hand, many developers prefer character-based editors for a couple of reasons. First, they are usually faster than GUI-based editors. Realistically, though, these days the difference usually isn't that noticeable. Second, OS/2 allows you to hook up a second display to your system, but it is supported for command sessions only and not the Workplace Shell. This ability allows you to run your editor on one display while testing your graphical program (even maximized) on the other monitor. When debugging graphical programs, most debuggers run in a command session anyway.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Interface considerations

During installation, you can choose from several keyboard layouts: Boxer's native layout, Boxer with CUA menus, the Boxer layout from version 5, the layout used by the Interactive Development Environment (IDE), which is included with Borland development tools, Brief, the OS/2 Enhanced Editor (EPM), Epsilon, MS Word, Multi-Edit, Norton, PFSWrite, QEdit, VDE, WordPerfect, and even WordStar. If none of those options fit your needs, you can use the RECONFIG utility to design your own keyboard layout.

Boxer supports multiple files and multiple windows (that is, within its single command-session window). Experienced OS/2 users will find it difficult to adjust to the non-standard window controls, such as resizing only from the lower-right corner. Standard clipboard options, such as cut, copy, and paste aren't in the Edit pull-down menu as they are in all other OS/2 programs. They're in the Block menu.

Boxer is sensitive to the number of lines per page you have defined for your screen. So, if you enter the **MODE CO80,43** command to change your command session to 43-

line mode, Boxer will use all of those lines.

Boxer was designed primarily as a programmer's editor and, as a result, it doesn't include any filters for importing or exporting files in any format other than plain ASCII text. Some word-processing-oriented features are included, such as pagination, but the only way to create special text, such as bold and italic, is to embed the specific control codes that tell your printer to switch to those modes. Does anybody remember those prehistoric incantations?

Power at a price

A lot of power is hidden behind arcane key sequences that must be memorized. A program doesn't have to be graphically based to have dialog boxes. I would like to see Boxer make better use of dialogs to simplify operation. To cite one example: when you try to open a file, a window opens with a list of files in alphabetic order. This list can also be shown in file size or date sequence, but you must know to hit the </> (forward slash) key to switch modes. Why not offer a push-button in the window, which would allow you to change the sort sequence, or a radio button for each sort option? It might create a little more work for the Boxer developers, but it would save the user from having to check documentation to identify the mystery keystroke that changes the sequence.

Boxer offers one very nice feature: the ability to compare two files and automatically locate the differences. When working with different generations of source code, this feature makes it quite easy to see the differences between them. Unfortunately, if you have added or deleted lines, you must manually scroll the windows to synchronize the contents before continuing the comparison.

Another interesting but sometimes confusing feature is the presence of 26 separate clipboards. The Clipboard Manager lets you switch between them, which can serve as a macro shortcut by letting you copy frequently used bits of text into different clipboards and paste from the desired clipboard as needed. It also allows you to append marked text to a clipboard without overwriting the existing contents.

Boxer includes a sort utility, which allows you to arrange marked lines in ascending, descending, or random order. Some math functions are also included, such as the ability to total a column of integers as well as an integer calculator. A line-drawing feature is also included, but you are warned that you should refer to your printer's manual to find the control codes that put it into Extended Character mode before they can be printed. DOS zealots will love it.

Syntax highlighting makes source-code browsing easier by displaying various parts of the program, such as commands, variables, and comments in different colors. Multiple levels of undo/redo help you to back out of inadvertent changes to your file. The global search-and-replace function includes support for wild-card characters, providing much more flexibility and power. You can create as many as 26 keystroke macros.

If you are working on a large development project, you might be editing the same set of files (program source, dialog source, headers, project file, make file, and so on) for several days. If you close Boxer without closing the files that are being edited, the list of files and the cursor locations are stored in a temporary file. If you restart Boxer without specifying a file, the temporary file is read and all the files that are found there are automatically loaded into Boxer.

You can also call your compiler directly from within Boxer. Compiler information is kept in the *default.cfg* file. Many compilers are already listed in that file, although some, such as IBM C Set++, are absent. You can define new entries, though, to support whatever compiler you use.

Glee or flee

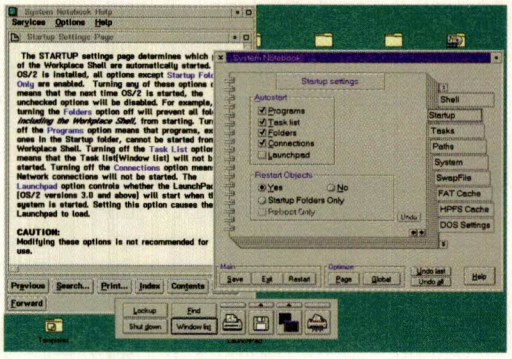
I don't recommend Boxer for word processing. While it does have some features that were designed for creating documents, it doesn't provide any real benefits over the word-processing module of the IBM Works package that is included with OS/2 Warp.

As a general editor, Boxer has some powerful features, but the character-based interface isn't for everyone. The Enhanced Editor that is included with OS/2 is extremely powerful. Other editors would have to have clear advantages to tempt people to pay for them.

I would say that Boxer would only be a consideration for programmers who need a character-based editor to run on a second display while developing and testing programs. I strongly suggest that you download the shareware version and spend a few days working with it before deciding to purchase the product. Programmers might end that evaluation with a new 32-bit editor.

System Notebook 1.3w

The *config.sys* file is a critical element in your OS/2 setup. Much of your system's functionality and performance is determined there. But to many people, browsing through it is a lot like reading the Bible in Hebrew—you can pronounce a few words, but between the ones you don't understand and the unusual characters, it becomes nearly impossible to interpret. System Notebook helps you break through the confusion and harness the power that is hidden in this configuration file.



By breaking the components of *config.sys* into organized notebook pages, you avoid the intimidation of facing 100 lines of system instructions at once. Many aspects are made simpler with check boxes that allow you to select options instead of having to type in precise keywords. Because it is still possible (although less likely) to make changes that cause problems, System Notebook keeps the previous version of your configuration file so you can easily go back

to the original.

To help you to avoid changes that will prevent your system from working, System Notebook doesn't include lines that load device drivers for the various hardware components of your computer. Besides, VacNat couldn't keep track of every possible option for every OS/2 device driver. You'll need to check the documentation for your hardware before modifying **device=** lines.

The on-line manual that is included is at least as valuable as the notebook. Together they provide a great amount of information about the components of the configuration file and what they mean. The *w* in the version number indicates that this version has been updated specifically for OS/2 Warp. A new Optimize pushbutton is included that instructs System Notebook to query your system's hardware and, based on such things as your physical memory and disk configurations, the program tries to supply settings that are best for your computer.

After you make and save your changes, you can click on Restart to do an automatic shutdown of OS/2. When you reboot, your changes will take effect.

Glee or flee

System Notebook isn't a large application that will revolutionize computing; it is a small utility that gives even the most novice users the possibility of fine-tuning OS/2 to best fit their needs. It is one of those programs that you wish IBM included with Warp.

Visual Parse++

Lexical analysis tools are perhaps the ultimate niche market. Not many people, outside of a development shop, need to perform the kinds of text breakdown and analysis that such tools provide. For that matter, not many people who work inside such shops need those tools either. For anyone who has such a need, though, such tools are invaluable.

You might not know what these tools are, but chances are good that you've used their by-products. If you ever wrote a command or batch file, or perhaps a macro for one of your applications, some program had to read your instructions and figure out what they meant.

The first step is to parse your instructions. Lines are broken down into their individual words, punctuation, and special characters, such as plus signs. Each of these elements is referred to as a token. Next, those tokens must be analyzed to determine whether they are keywords, operators, or some other type of token. The sequence of those elements is then analyzed to see if it makes sense. For example, 2+2=4 might be valid, while 2+=24 makes no sense. Finally, the program performs the operation that you requested. These parsing and analysis functions are so common in software that special tools were developed just to help programmers write these parts of their applications.

The UNIX tools lex and yacc have long held a stranglehold on the mar-

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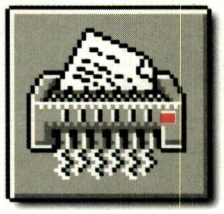

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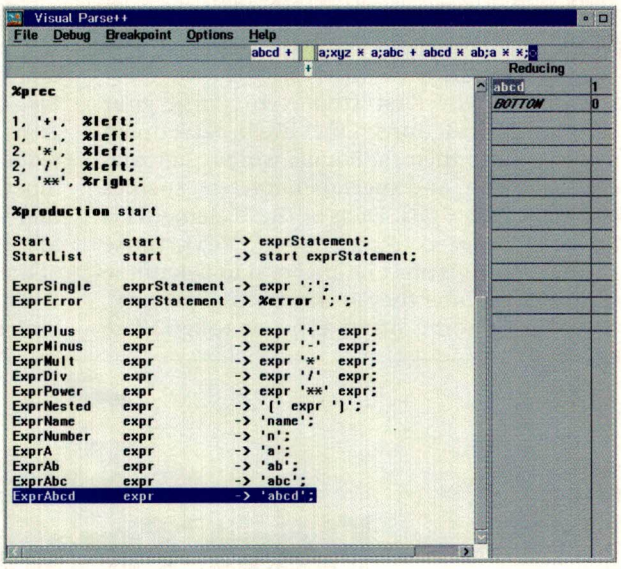
ket. SandStone wisely chose to build on that base instead of starting from scratch. The main enhancement that Visual Parse++ provides is the graphical interface, which allows you to follow the process as it happens. Visual cues let you know how far down the parsing stack the routine is at any point in time. You can watch the reductions as they take place and see which regular expressions are matched and the text that they matched. Anyone who develops routines for other environments will be happy to hear that support for double-byte character strings (DBCS) and Unicode is included.


Visual Parse++
File Debug Breakpoint Options Help
abcd + a;xyz * a;abc + abcd * ab;a * x;
Reducing
abcd 1
BOTTOM 0
%prec
1, '+', %left;
1, '-', %left;
2, '*', %left;
2, '/', %left;
3, '**', %right;
%production start
Start start -> exprStatement;
StartList start -> start exprStatement;
ExprSingle exprStatement -> expr ';';
ExprError exprStatement -> %error ';';
ExprPlus expr -> expr '+' expr;
ExprMinus expr -> expr '-' expr;
ExprMult expr -> expr '*' expr;
ExprDiv expr -> expr '/' expr;
ExprPower expr -> expr '**' expr;
ExprNested expr -> '[' expr ']';
ExprName expr -> 'name';
ExprNumber expr -> 'n';
ExprA expr -> 'a';
ExprAb expr -> 'ab';
ExprAbc expr -> 'abc';
ExprAbcd expr -> 'abcd';

Take a look at the screen shot of Visual Parse++ in debug mode. The main portion of the window contains the rule you have created. The line just beneath the menu bar shows the file that is being processed by that rule file. Data on the left side of that bar has already been processed and text on the right side is waiting to be examined. The entry field in the middle allows you to insert information into the file dynamically. That's just one attribute of an extremely powerful debugger. In fact, it is the power of that debugger, more than any other aspect, that sets Visual Parse++ apart. The debugger effectively detects and flags conflicts in your rule file that can leave the routine uncertain as to how to proceed.

Visual Parse++ feels much more like a generic lexical tool than MKS Lex and Yacc, which were clearly designed specifically for use by C programmers (much like the original UNIX versions). Strong C programmers might consider that a disadvantage, but I liked the overall feel of the rule file constructs. The same rule file can be used to generate routines for C, C++, or REXX. Visual Parse++ does a good job of including comments in the generated code to help you follow their logic.

The generated code for all languages depends on a run-time DLL for its function. Because these routines will be

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used mostly by people who are developing programs for distribution, the Visual Parse++ license agreement gives you permission to include the DLL with your programs. The included documentation provides more than enough detail to allow you to modify the generated code directly. The dozens of SSLex and SSYacc APIs are described thoroughly. On the other hand, judicious use of the rule file debugger should make it unnecessary to spend too much time at this level of detail.

Glee or flee

Other lexical analysis products are available free of charge on the Internet as well as through other resources, such as the Hobbes CD-ROM. It would certainly be prudent to examine those products before buying Visual Parse++. On the other hand, I strongly suggest that you take a look at the new level of ease that Visual Parse++ brings to this tool category. If you develop parsing and analysis routines, you might find that you can't afford not to take advantage of this product, which has versions for both OS/2 and Windows.

RESOURCES:

Visual Parse++ ($299)
SandStone Technology Inc.
70 Tidwell Ln.
Henderson, NV 89014
(800) 988-9023
(702) 896-7623
E-mail: *71332.2577@compuserve.com*
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System Notebook 1.3w ($15)
VacNat Software
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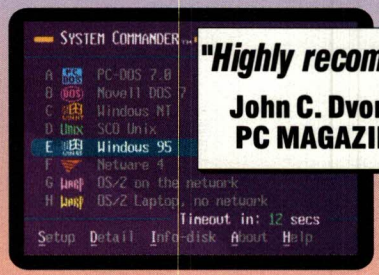

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103 OS/2 Tricks, Tips, Tools and Shortcuts

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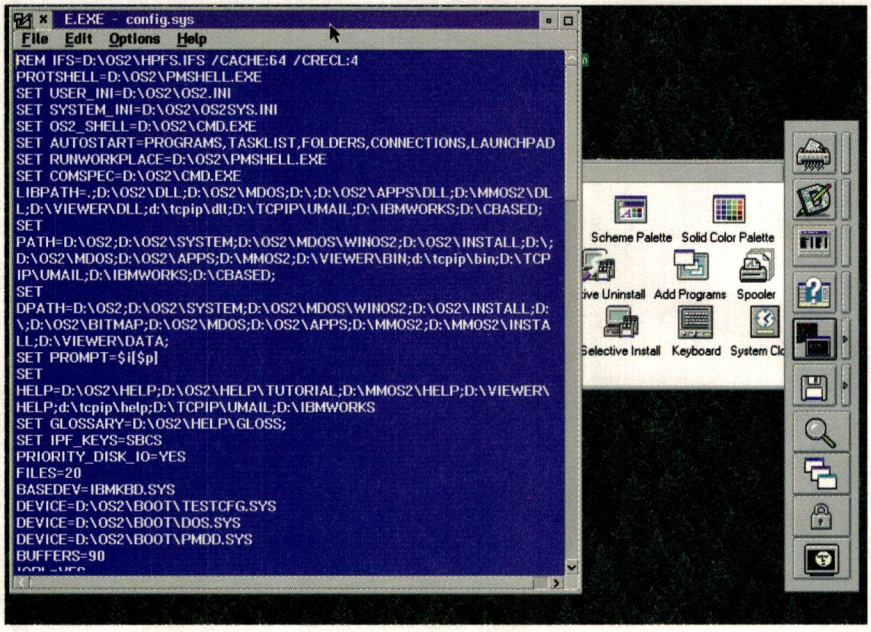
Tricks and Tips

Part of the power of OS/2 is the depth and breadth of user customization options. You can exploit—or ignore—most parts of the operating system depending on your needs, preferences, and interest in learning what's under the hood. The command-line fanatic can run the whole operating system from a series of key strokes, while the GUI enthusiast can make everything just a mouse click away. The potential is endless.

That's why some of us cringe when some folks complain about OS/2's rigidity and unfriendliness when it's clear that many of their complaints could be overcome with a little customization. But it's hard for many OS/2 users, who are probably already busy enough, to take the time to learn a new operating system and how to tune it to their tastes. And even the most experienced OS/2 user doesn't know *all* the tricks.

That's why we're presenting our second-annual collection of OS/2 Tips. With the help of some of our regular writers and contributing experts, we've assembled our favorite hints and suggestions—all to make OS/2 work the way *you* want it to. The following pages will give you examples of tips that make OS/2 work better and the work you do with it easier.

Let us know what you think, or send us *your* favorite OS/2 tips: You'll find us at *os2mag@mfi.com*, or 71154,676 on CompuServe. Prefer hard copy? Write to Tips, *OS/2 Magazine*, 600 Harrison St., San Francisco, CA 94107, or fax (415) 905-2499. (P.S.: We've even included a page of tips for our favorite Windows 95 users. We hope you find it useful!)



Config.sys Tips

by David Moskowitz

Before we begin, backup your *config.sys* file—especially if you're going to experiment with tuning your system.

1 Make *config.sys* readable. The second thing you might want to do is add to your config.sys file's readability. Add as many blank lines as you like, or add comments on any line, as long as it's prefaced with the letters rem (for "remark").

You can convert most of *config.sys* to lower case to make it easier to read. Be careful! Some vendors install case-sensitive environment variables that might not work properly if you arbitrarily change the case of the entire file. One notorious example is Borland International's BRIEF text editor.

2 Create a floppyless workstation. To purposely disable floppies, remove the corresponding **basedev** statement from your *config.sys*. For ISA and EISA systems, remove the line that reads **basedev=ibm1flpy.add**. If you have a Microchannel PC, remove the line that reads **basedev=ibm2flpy.add**.

Since *config.sys* is read after your OS/2 PC boots up, this trick won't keep the system from booting from the floppy drive, it merely renders the floppy useless while OS/2 is running.

3 Stop applications from restarting. If you don't want applications that were running when you closed the system to restart when you reboot, add the following to your *config.sys:*

```
RESTARTOBJECTS=X
```

where **X** is **NO** to prevent all objects from restarting or **STARTUPFOLDERSONLY** to only restart objects in the startup folders (yes, you can have more than one).

4 Suppress application error codes. If you don't want to see the application errors pop-ups (usually something that reads "Line xxx SYS3175 Error") add the following line to your *config.sys:*

```
supresspopups=x
```

where **x** is the drive in which you want OS/2 to place the information (note, this statement does not contain a colon). Similarly, if you want to create a dump of the program that failed add the line **dumpprocess=x** (same format—you don't have to use the same disk drive).

5 Improve CD-ROM performance. If you have a CD-ROM drive installed your system, modify the IFS line that installs CD-ROM support to read something like

```
ifs=c:\os2\boot\cdfs.ifs /q /c:4.
```

The magic cookie is the last parameter **/c** that increases the cache size for the CD-ROM drive. For some drives with a small (less than 256K) or missing cache, a larger cache size can improve performance. The default value is 2 if you don't add the parameter (128K cache) and the value shown increases to 256K.

6 Load DOS device drivers after you boot. Unless you need DOS device drivers in every DOS session, do not load them in *config.sys*. This approach wastes valuable memory that could be used for application execution. It is better to load needed device drivers in the **dos_device** setting for DOS or Windows Program objects.

7 Force chkdsk at boot time. If you want to force **chkdsk** on some or all disk drives, prefix the appropriate drive letter in the auto-check parameter with a plus sign when you boot your system . For example, if the IFS line reads:

```
ifs=c:\os2\boot\hpfs.ifs
/cache:1024 /crecl:64
/autocheck:cfghi
```

and you want to force a **chkdsk** for drives F and H, change the parameter to:

```
/autocheck:c+fg+hi
```

Similarly, if your FAT **diskcache** line

reads:

```
diskcache=512,lw,32,ac:demno
```

to force **chkdsk** on E and M, change the parameter to:

```
ac:d+e+mno
```

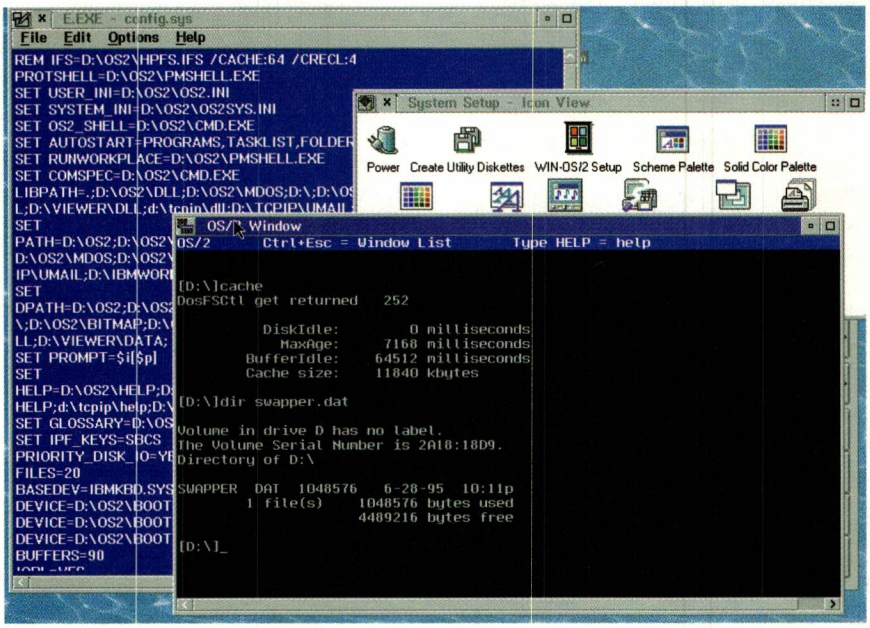
Swap and Cache Tips

by David Moskowitz

8 Increase the swap file's initial size. If your swap file is on an actively used FAT partition, the chances are good that as this FAT disk become fragmented, your swap file will also become fragmented. A badly fragmented swap file can have a serious impact on performance. One solution is to change the initial swap file size. Locate the **swappath=** statement in *config.sys*.

There are three possible parameters for this statement; the first is the location of the swap file, the second is the amount of space to reserve on the swap disk, the third is the initial swap file size. For example, **swappath=g:\ 20480 30720** tells the system to place the swap file in the root directory of drive G:, start warning the user they are running out of swap space when less then 20MB is available on the drive, and start the swap file at 30MB.

9 Determine the swap file's best initial size. How big should you make



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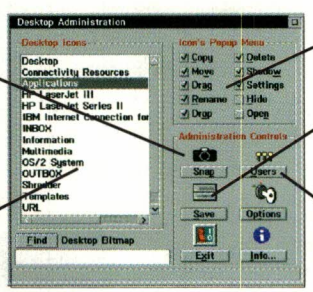

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the initial swap file? It depends on how big your swap file grows. There are a few tools you can use to determine the maximum swap file size. The easiest is *dinfo*, one of the IBM Employee Written Software programs available on CompuServe's OS2USER forum in Library 13, and on the Internet in *hobbes.nmsu.edu/os2* in the *ibm/ews* directory as *dinfo.zip*. Use *dinfo* to record the maximum sized attained since booting the computer. After you've used *dinfo* for a couple of days (to get some idea of an average) set the **swappath** parameter accordingly.

10 Put the swap file in the best location. The default location (in the *\os2\system* directory on the boot disk) is usually not the best location for the swap file. Instead, place the swap file in the most frequently used logical disk drive. If you have more than one physical hard disk, place the file in the least frequently used physical hard drive.

Why? Disk access is slower than RAM. Any time the system uses the swap file, everything slows down. If the file is fragmented, disk access is slower. If the disk head is in constant use in another partition, it takes time to move the head to the partition that contains the swap file.

11 Enable the lazy-write cache. Both HPFS and FAT partitions work faster with a cache. HPFS is designed to work with a "lazy-write" cache. Don't disable it (**/lazy=on** for HPFS—on the IFS line; and **LW** parameter on the **diskcache** line for FAT). With the lazy-write enabled, the system optimizes disk writes to cause minimal impact to applications by postponing writing if the system's really busy. System performance can improve by almost 20 percent by enabling lazy-write.

If you're wondering, "What happens if there is a power failure and data is still in the cache," consider that a sudden power failure is always a potential disaster, regardless of cache state. If the power failure occurs while the disk write is in progress, you stand to loose not only this data but the entire file. If power failures are a concern, we suggest leaving lazy-write enabled and install an uninterruptible power supply.

12 Small disks or low RAM means FAT. If you have less than 8MB RAM, or you have a small hard disk (smaller than 128MB), you should probably use only one file system, and we recommend FAT. As the hard disk size increases, HPFS makes more sense. For truly fast disk access with large partitions use HPFS (IBM isn't kidding about High Performance).

13 Tune the cache size carefully. Tuning the cache's size is a balancing act between optimal disk access and optimal program execution. Memory used for a disk cache is taken away from applications, and can increase swapping, while memory used for applications is not available for the disk cache, and may slow down disk access.

If you're using only one file system and have 8MB RAM, start by allocating a roughly 512K cache. Add 512K for

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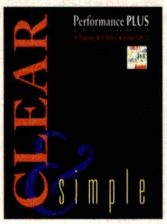

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each additional 4MB RAM. If you use both HPFS and FAT, start with 512K for the primary (most used) file system and 256K for the secondary. Use the same rule for adding cache based upon memory for the primary and add 256K to the secondary file system cache for each 4MB RAM.

Once you've made these adjustments in your *config.sys* file (the first parameter on the **diskcache** line for FAT and the **/cache:** parameter on the IFS line that installs HPFS), monitor system performance. If your swap file size grows, increase the initial allocation. If performance suffers, decrease the amount of RAM used for caching.

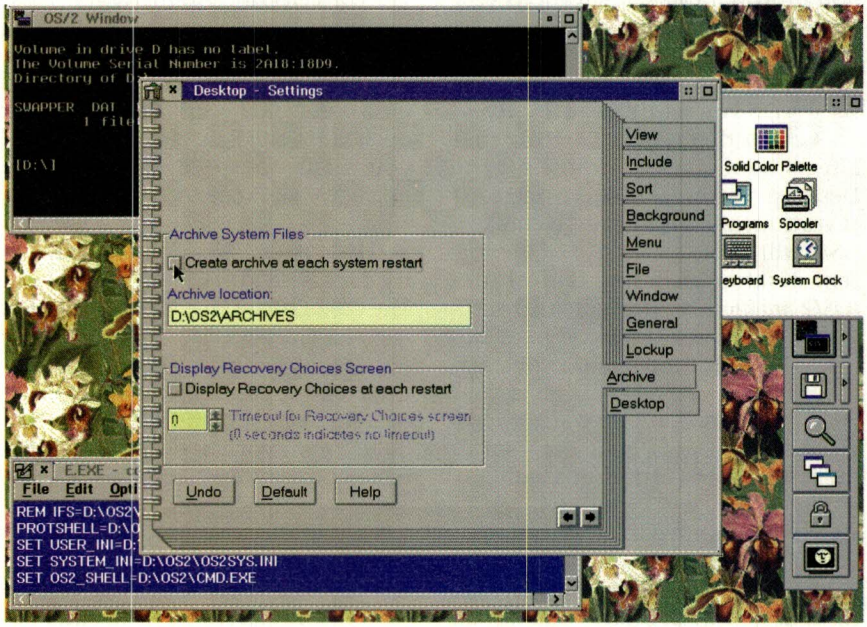
System-Tuning Tips

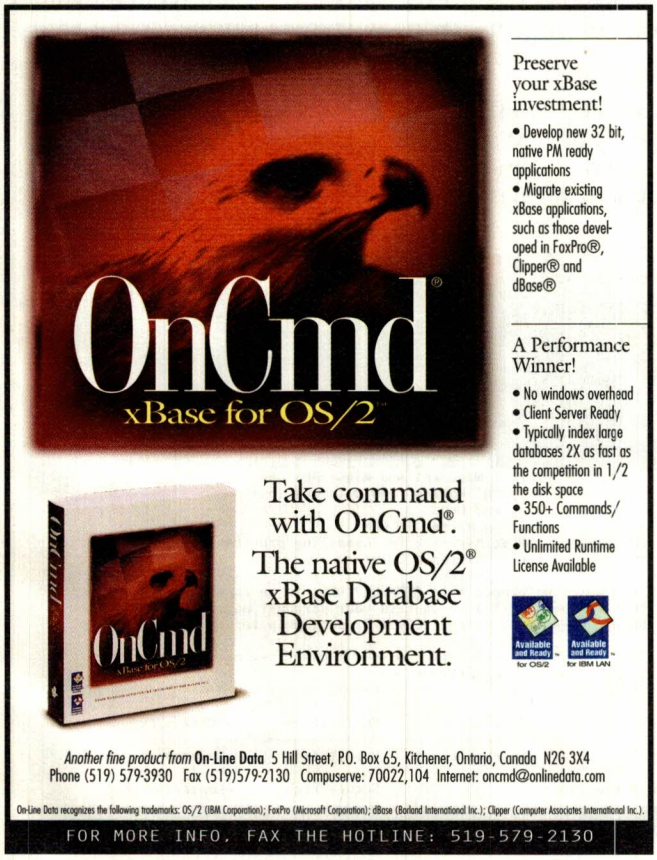
By David Moskowitz

Here are some tricks to improve your OS/2 system's performance.

14 Remove fonts you don't use. To decrease boot time, first check to make sure you need the fonts you have installed. Many people install additional fonts beyond those installed automatically by OS/2. Since OS/2 takes the time to check each installed font every time you boot your PC, you'll save boot-up time by using the font palette to remove the extra ones.

15 Think about Fast Load vs. Fast Boot. If you have Fast Load

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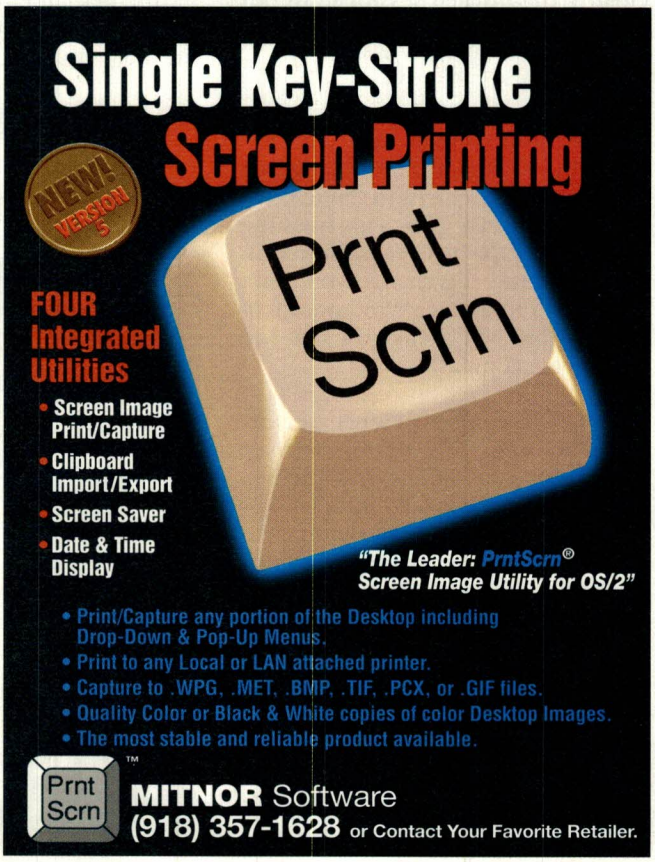
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enabled in the Win-OS/2 Settings object, your system starts Windows every time you boot up. While this speeds future loading of Windows applications, it slows boot time. If you don't run Windows applications very often, you'll speed up boot time by turning off Fast Load.

16 **Do you really need archives?** Another desktop setting that affects boot time is located on the Desktop Settings Archive page. If "Create Archive on boot up" is checked, OS/2 will create an archive of the current desktop including critical files (OS/2 *.ini* files, *config.sys* and user-specified files) every time you boot up. Instead, enable the desktop archive feature after you've made changes to your configuration that you want to preserve, then reboot your system. After the system boots, disable this setting.

17 **Close unneeded applications.** I still remember the call from the person who wanted to know why OS/2 was *sooooo slow*. As it turns out, he had more than 100 open DOS sessions. By closing the unused sessions (all but two!) system performance dramatically improved.

18 **If you're OS/2-only, use protectonly.** If you don't use DOS and Windows applications, change the **protectonly** statement in *config.sys* to read **protectonly=yes**. This frees the low 640K for use by OS/2 applications. Once you make this change, you won't be able to run DOS or Windows applications until you change the line and reboot your computer.

19 **Deldir also deletes performance.** The **deldir** setting, which copies deleted files to a safe area in case you change your mind, seriously affects performance. The **deldir** environment variable set within *config.sys* or a specific command-line session provides some degree of protection against accidental file erasure. However, many file system operations will take longer. Instead of enabling this facility, it might be better to purchase a set of utilities that provide an undelete command.

20 **Upgrade weak hardware links first.** A certain order should be followed in upgrading hardware to improve performance. In general, if you want to speed up application execution, add memory. If you want to speed up the display, upgrade or add a video accelerator. No matter how fast the rest of your system is, if you have a slow display, you might not see or perceive any impact from other tuning measures. If you want to speed up disk operations, add a caching controller. If you want to speed computation, upgrade your processor.

Enhanced Editor Tips

by Bill Schindler

The OS/2 Enhanced Editor (EPM) gets a bad rap. Granted, EPM initially seems unfriendly, but with a little bit of customization, you'll discover it to be a flexible, easily modifiable tool. Despite quite a few excellent alternatives, EPM remains my primary editor.

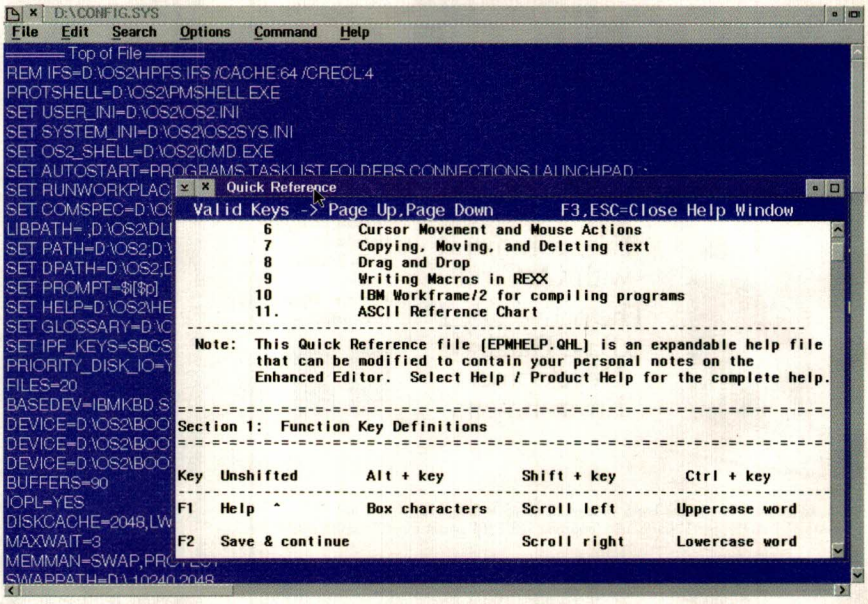
21 **Enable the "edit ring."** This allows more than one file to be loaded in the same edit session. Choose Options, Preferences, Ring enabled, then Options, Save Options to make the setting permanent. <F11> and <F12> will let you move through the files in the ring.

22 **Work with an OS/2 shell inside EPM.** Many of EPM's commands are entered from its command dialog <Ctrl+I>. Among them is the ability to work with an OS/2 shell inside the editor. If you enter **shell** in the command dialog, EPM will start an OS/2 command session right within the editor. (If the edit ring isn't turned on, starting the shell will automatically enable it.)

Most programs that you'd run from the command line, such as compilers and REXX programs, run just fine within this shell. If you position the cursor on a prior command and press <Enter>, that command will be executed again. The shell is editable and scrollable.

23 **Use DIR to edit multiple files.** If you want to edit several files, type **dir** to get a directory listing. Position the cursor on a file and press <Alt+1>. The file will be loaded into the Edit ring, as if you'd typed in the name by hand.

24 **Use file-loading shortcuts.** With the ring enabled, <F8> brings up the Add File window. To load another file that's in the same directory as the current file in your edit ring, type an equal-sign and the file name. For example, with *c:\config.sys* in the edit window, typing **=autoexec.bat** will load that file from the *c:* directory. Typing **=.bak** will load a file of the same name but different extension (*c:\config.bak*). To reload a file you've edited before, scroll through the list window with the cursor keys, and press <Enter>


D:\CONFIG.SYS
File Edit Search Options Command Help
Top of File
REM IFS=D:\OS2\HPFS.IFS /CACHE:64 /CRECL:4
PROTSHELL=D:\OS2\PM\SHELL.EXE
SET USER_INI=D:\OS2\OS2.INI
SET SYSTEM_INI=D:\OS2\OS2SYS.INI
SET OS2_SHELL=D:\OS2\CMD.EXE
Quick Reference
Valid Keys -> Page Up,Page Down F3,ESC=Close Help Window
6 Cursor Movement and Mouse Actions
7 Copying, Moving, and Deleting text
8 Drag and Drop
9 Writing Macros in REXX
10 IBM Workframe/2 for compiling programs
11. ASCII Reference Chart
Note: This Quick Reference file (EPMHELP.QHL) is an expandable help file that can be modified to contain your personal notes on the Enhanced Editor. Select Help / Product Help for the complete help.
Section 1: Function Key Definitions
Key Unshifted Alt + key Shift + key Ctrl + key
F1 Help ^ Box characters Scroll left Uppercase word
F2 Save & continue Scroll right Lowercase word

on the highlighted file name.

25 Bypass the Search dialog. EPM has powerful search capabilities, but the Search dialog doesn't remember earlier searches. So, if you have three complex changes to make over a series of files, you'd have to type them over and over again in the Search dialog. Instead, use the command dialog and use a Change command. The syntax is:

```
c /old text/new text/ *
```

The optional asterisk tells the editor to change the value throughout the file without confirmation. For example,

```
c /water/beer/ *
```

will improve any file immeasurably. The command is then stored in the command history, and can be recalled with cursor keys.

26 Create changes with embedded slashes. Any non-blank character you type after the *c* to begin the Change command is used to delimit the old-text and new-text fields. So, if either the old-text or new-text includes a slash, just choose another letter.

```
c \windows\os/2\ *
```

is another favorite file improvement.

27 Change non-keyboard characters. Sometimes you need to change a value that contains characters that aren't accessible from the keyboard. You could find a character chart and use <Alt+keypad> to enter the characters in the change command, but here's another way. Find the first occurrence of the "funny character," and type <Ctrl+L>. EPM will copy that line into the command dialog; edit the dialog to turn it into a Change command, and away you go.

28 Save commands to a file. Another way to execute a series of frequently used commands is to save them in a file. Import the file to the beginning of the file you'll want to massage, block mark the lines, and press <Alt+=>, which executes the current line or marked text as EPM commands.

29 Create an EPM REXX macro. If you use a series of EPM commands often, create an EPM REXX macro. Put a /* */ comment at the beginning of the first column of the first line, and save the file with a *.erx* extension, such as *h2o2beer.erx*. For ease of access, save the file in the directory listed in the **epmpath** in your *config.sys*. Enclose each command in single or double quotes. To run the macro against the current file, type **rx h2o2beer** (the extension isn't necessary) from the command dialog. REXX and EPM are well integrated, so if you like one, take the time to learn the other.

Basic <Alt+F1> Tips

by David Reich

OS/2 Warp has taken some ideas and concepts that were implemented as renegade functions in prior versions and polished them up. One example,

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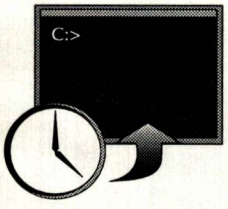

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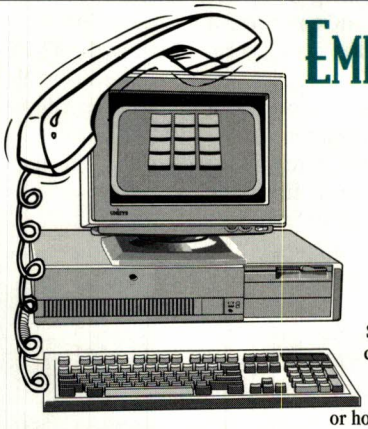

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<Alt+F1>, is a key combination that can change the way OS/2 boots up.

30 <Alt+F1> under OS/2 2.x. In OS/2 2.0, 2.1, and 2.11, you could recreate a default Workplace Shell desktop by pressing and holding the <Alt> key along with <F1> as soon as the computer completed its power-on self test (POST), or as soon as you acknowledged the Boot Manager menu. As a result of <Alt+F1>, the system would recreate your Workplace Shell desktop as it was immediately after you installed the system, and replaces *config.sys* with the one in the *\os2\install* directory.

31 <Alt+F1> under OS/2 Warp. When you boot up an OS/2 Warp system, immediately after the POST or when the Boot Manager menu disappears, you will see a white box with "OS/2" next to it in the upper left corner of the screen. If, while you see this box, you press <Alt+F1>, the system will display an archive retrieval/maintenance menu. On this menu you have several choices:

<Esc> continues booting from the current *config.sys* file and the current Workplace Shell desktop configuration.

C moves you to an OS/2 command prompt, where you can copy or move files, manually restore files, or edit your current *config.sys* file using the new text-mode *tedit.exe* editor.

M brings up a maintenance desktop from which you can perform other operations.

V resets your video configuration to standard VGA. This option is useful if you have problems with your video configuration or if you change video cards and need to install the new video driver.

X restores an archive of your desktop, if you have created one.

32 Look inside *altf1.cmd*. This command provides a great deal more functions than the simple <Alt+F1> in prior versions of OS/2, which was not even documented. Not only is this function now available, but it is extendible and configurable.

To begin with, this menuing system works with several files that reside in the *\os2\boot* directory on your boot drive. The first is *altf1.cmd*, which is the command file that gets called when the menu is displayed and the keystrokes previously described are pressed. When you look at *altf1.cmd*, you will notice that it is a straight DOS-like batch-command language file, and not a REXX program file. This early in the process, the REXX interpreter and functions are not available. Here is the code inside *altf1.cmd* that handles pressing of the letter V:

```
rem
rem if a v or v is passed, call setvga
rem
if v==%1 goto setvga
if v==%1 goto setvga
```

33 Look inside the *alt1x.scr* files. The other three key files used by <Alt+F1> are *altf1bot.scr*, *altf1mid.scr*, and *altf1top.scr*. These three files contain only text and, as the names imply, make up the menu screen you see when you press <Alt+F1> at the right time. The screen is divided into thirds for the purpose of this menu, and each file represents one third. You can view them by using the **TYPE** command or by using a text editor. Note that these files only contain the text that appears on the menu and, whether or not you put new menu choices in the text, it has no effect on which letters will be accepted as input. By simply changing the text in any one of or all the *.scr* files, you can customize what you see when <Alt+F1> is pressed. Thedefault contents of *altf1top.scr* are shown in Listing 1.

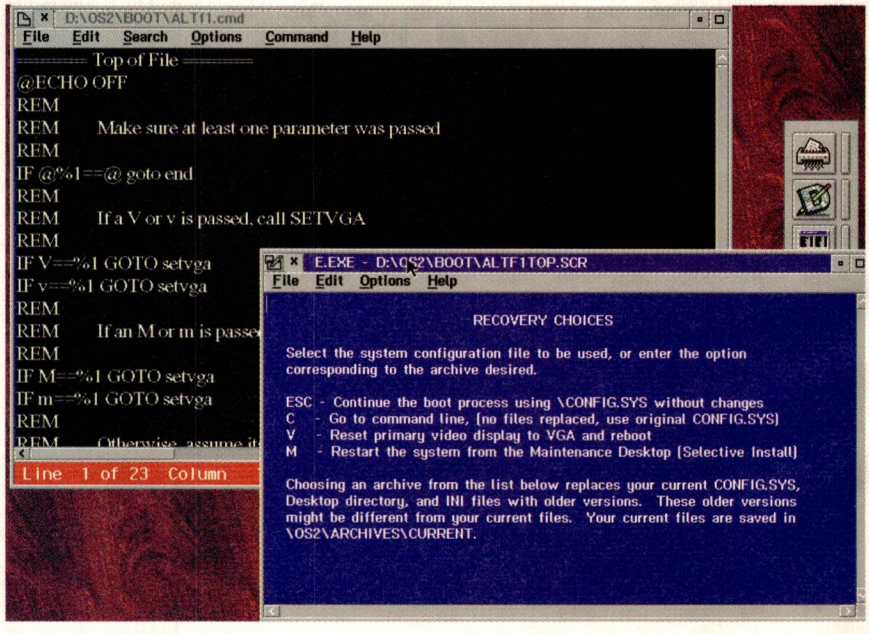
Customizing <Alt+F1> Tips

by David Reich

34 Remove <Alt+F1> menu choices. To remove some or all of the menu choices in *altf1.cmd*, simply edit them out of the appropriate *.scr* file. To avoid a user accidentally selecting a (formerly) valid choice and the system taking the default action, make sure to edit the appropriate part of *altf1.cmd*.

35 Add new menu choices. It would be a reasonable assumption to think that, if you added new text for new choices in the *.scr* files and added checks for other letters pressed in *altf1.cmd*, that would be it. Sorry! The OS/2 system designers have set it up so that *altf1.cmd* is only called when you press V, C, M, or X. However, you can add new menu choices for other letters by setting up files called *config.x* or *altf1x.cmd*, where *x* represents those other letters.

36 Use *config.x* to set up alternate configurations. Say you


D:\OS2\BOOT\ALTF1.cmd
File Edit Search Options Command Help
Top of File
@ECHO OFF
REM
REM Make sure at least one parameter was passed
REM
IF @%1==@ goto end
REM
REM If a V or v is passed, call SETVGA
REM
IF V==%1 GOTO setvga
IF v==%1 GOTO setvga
REM
REM If an M or m is passe
REM
IF M==%1 GOTO setvga
IF m==%1 GOTO setvga
REM
Line 1 of 23 Column
E.EXE - D:\OS2\BOOT\ALTF1TOP.SCR
File Edit Options Help
RECOVERY CHOICES
Select the system configuration file to be used, or enter the option corresponding to the archive desired.
ESC - Continue the boot process using \CONFIG.SYS without changes
C - Go to command line, [no files replaced, use original CONFIG.SYS]
V - Reset primary video display to VGA and reboot
M - Restart the system from the Maintenance Desktop [Selective Install]
Choosing an archive from the list below replaces your current CONFIG.SYS, Desktop directory, and INI files with older versions. These older versions might be different from your current files. Your current files are saved in \OS2\ARCHIVES\CURRENT.

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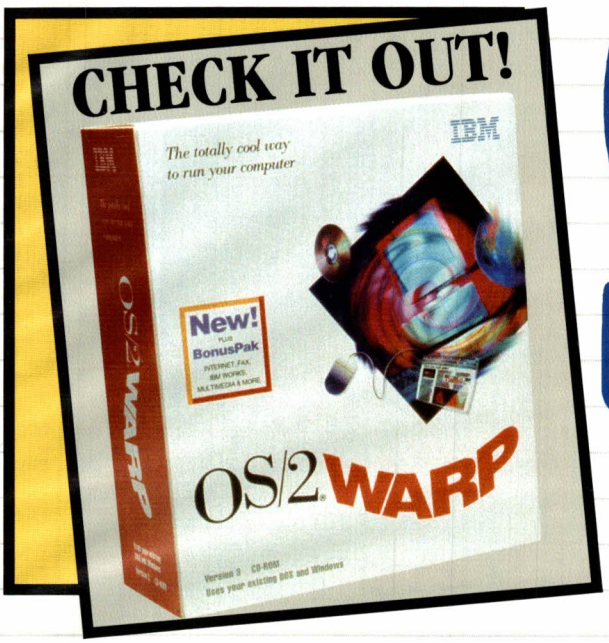

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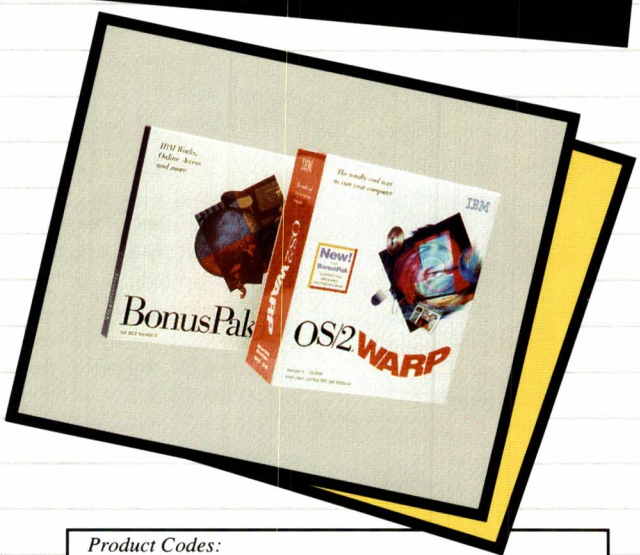

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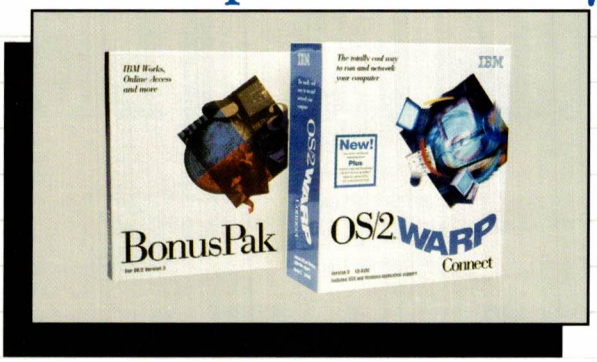

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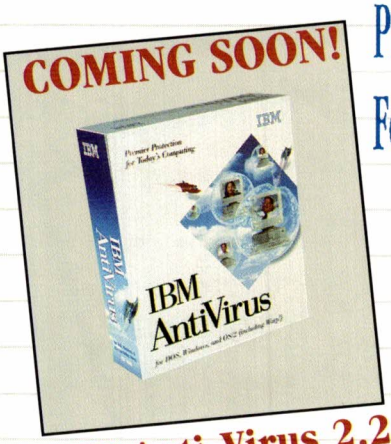

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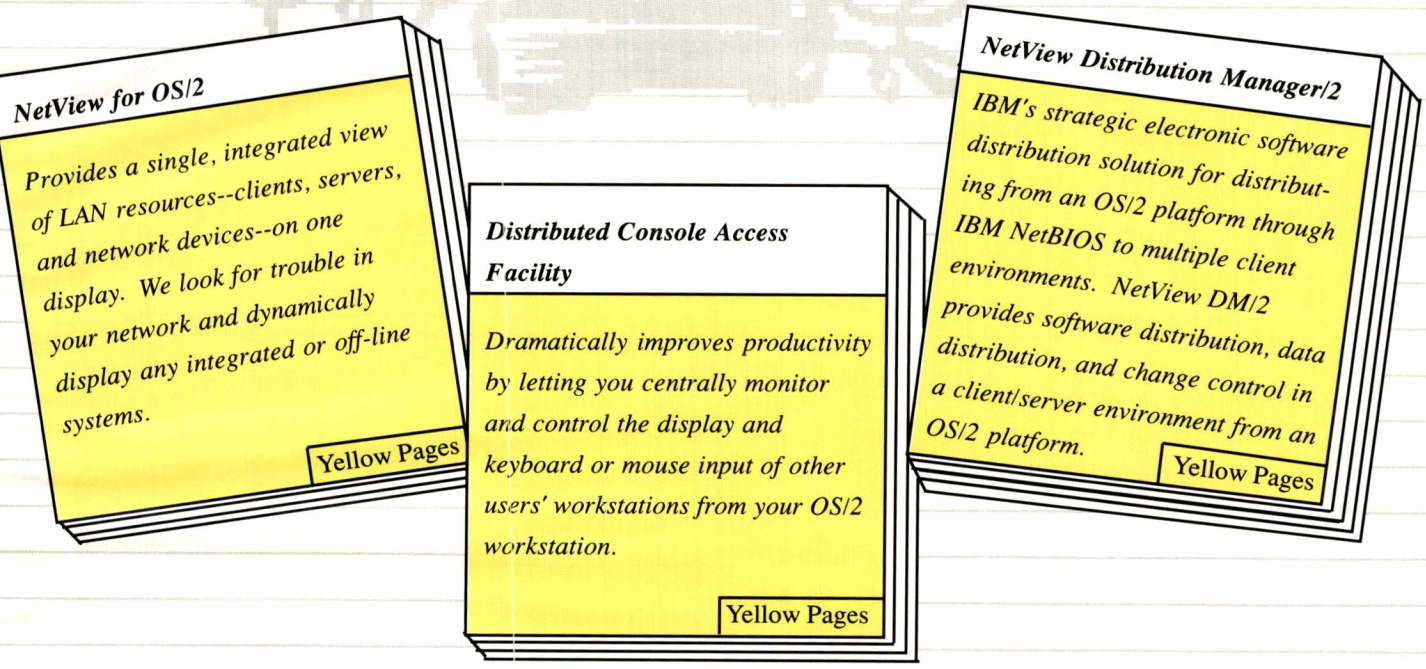
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Listing 1: Default contents of *altf1top.scr*.

```
RECOVERY CHOICES
Select the system configuration file to be used, or enter the
option corresponding to the archive desired.
ESC Continue the boot process using \CONFIG.SYS without
changes
C   Go to command line, (no files replaced, use original
CONFIG.SYS)
V   Reset primary video display to VGA and reboot
M   Restart the system from the Maintenance Desktop (Selective
Install)

Choosing an archive from the list below replaces your
current CONFIG.SYS, Desktop directory, and INI files with
older versions. These older versions might be different
from your current files. Your current files are saved in
\OS2\ARCHIVES\CURRENT.
```

have a laptop computer that has a token ring LAN PCMCIA card in it. When you start your system on an airplane or in a hotel room, you are obviously not connected to the LAN and you will get LAN errors.

The solution: Make a different *config.sys* file for traveling called *config.a* (where *a* means "away," perhaps) without the LAN drivers. This *config.a* file must be stored in the *\os2\boot* directory of your boot drive.

After you've built *config.a*, update one of the *.scr* files with the indicators to press A when traveling. Then, while traveling, press <Alt+F1> during the boot process, and select A to boot using the special configuration.

37 Add menu choices with *altf1x.cmd*. Creating new menu choices isn't limited to custom *config.sys* files; you can also make custom *.cmd* batch files. If you create a file called *altf1x.cmd*, where *x* is any letter (other than the V, M, C, or X already defined by the system), pressing that letter at the <Alt+F1> menu will execute that command file.

So, in this case, you could update the *.scr* file(s) with text indicating letters for which you have command files. Note that these command files must also reside in the *\os2\boot* directory of the boot drive.

Unlike custom *config.x* files, the system will *not* continue booting automatically after your custom *altf1x.cmd* file is executed. To continue the boot sequence, you'll need to manually press <Esc>. I recommend that you end the *altf1x.cmd* file by displaying a prompt to the user requesting that they press <Esc> to continue booting.

38 Customize OS/2 archiving functions. The OS/2 Archiving functions can also be customized. A file in the *\os2\archives* subdirectory of your boot drive can be modified for just this purpose. This file, *os2.key*, contains the names of all of the files to be archived (in addition to the *\desktop* directory structure on your boot disk) when you select to archive your system. Using the same format, you can add you own favorite files to this list. The format of the lines in the file are:

```
keyfile:c:\config.sys
keyfile:c:\startup.cmd
```

and so on, where **keyfile** is the operational keyword, followed by the path and file name to be archived. So, for example, if you wanted to save *ibmlan.ini*, you would add:

```
keyfile:c:\ibmlan\ibmlan.ini
```

at the bottom of the file.

Emergency Preparedness Tips

by David Moskowitz

Accidents happen! You can prevent total destruction and loss if you plan ahead, know what to do, and know where to look.

39 Learn the three important rules. The three most important rules of emergency preparedness are Backup, Backup, and Backup. Another way to think about it is "Backup early and often."

40 Power protection is more than a UPS. It's a good idea to keep AC-powered desktop PCs connected to an uninterruptable power supply (UPS). If the UPS doesn't regulate voltage, be sure to add a voltage regulator. Don't forget to put a surge suppresser on the phone lines—that's an easy way for lightning to get into your system.

41 Don't use DOS backup software. Do *not* use a DOS backup program to backup your OS/2 system. The DOS application doesn't know anything about OS/2's Extended Attributes, does not save them, and without the EAs, the tape may be useless.

42 Keep backups of key system files. Even if you have tape backup—and especially if you don't—you should back up several files each time they change. They'll all fit onto a single floppy disk. These files include *config.sys, startup.cmd, autoexec.bat, os2init.cmd, os2.ini,* and *os2sys.ini*. If you use Windows programs, don't forget *system.ini* and *win.ini*.

43 Find a missing *country.sys*. Sometimes OS/2 refuses to boot, and displays an error message saying it can't find *country.sys*. That message might lead you on a wild-goose chase. here's what it *can* mean:

- The file really is missing. Check your *config.sys* for a line similar to **country=001,c:\os2\system\country.sys** . If the file is in the specified directory, check the problems listed next. If it isn't there, restore it from floppies (it will be on installation floppy disk 1).
- The *config.sys* file itself is missing. Either restore your backup or reboot using <Alt+F1> and restore the most recent desktop archive.
- You have an interrupt conflict. Use **rmview** to determine if there is a conflict. The solution is to adjust the hardware.
- If you have a tape drive attached to the floppy or hard disk controller without an appropriate device dri-

ver, disconnect the device or install its special driver.

If none of these suggestions work, try removing the hard disk base device driver (**basedev=ibm1s506.add** in *config.sys*) and substitute **basedev=ibmibt12.i13**. The system will run slower, but you should be able to get by this problem.

44 Solve DOS print problems. Sometimes DOS applications, including terminate-and-stay-resident (TSR) programs refuse to print under OS/2. That's often because they try to capture all **INT 17** interrupts—and OS/2 won't allow them to. If you know it's a problem with that particular DOS program (because other DOS programs will print), the solution is to load the special OS/2 supplied device driver *lptdd.sys*.

The best way to load this driver is using the **dos_device** setting for the Program Reference object that causes the problem. Add the following to the entry field for the object (changing the drive letter, if necessary) to *c:\os2\mdos\lptdds.sys*.

45 Make DOS applications print. If your DOS applications won't print until the session ends, load *lptdd.sys*. With this driver loaded, the <Ctrl+Alt+PrtScrn> key sequence forces the job to print without closing the DOS session.

46 Reset the Desktop password. **Makeini** is an OS/2 command that creates the special binary *.ini* files from readable text files. The syntax of this command is:

```
makeini binary_ini_file.ini
source_text_file.rc
```

The most common use for this command is to reset the desktop password. Reboot your PC and use <Alt+F1> to get to a command line. Type the following:

```
makeini os2.ini lock.rc
```

When you reboot your computer, it will no longer have a desktop password.

LIBPATH Tips

by David Reich

Libpath is an important environment variable in OS/2. Just as **path** specifies where OS/2 should look for programs, **libpath** tells OS/2 where to search for dynamic link libraries (DLLs), which are common pieces of program code used by many programs, including OS/2. The **libpath** states not only where to search for DLLs, but also in which order to search these directories. This ability can be important when several DLLs have the same name in your system, or if different programs need specific versions of a particular DLL.

Under OS/2 Warp, the **libpath** statement is now dynamically modifiable. It gets around arbitrary problems in OS/2 2.x having to do with its fixed length, and the user's inability to modify the **libpath** after booting.

47 Get around the 256-character libpath limit. First of all, the limit on the **libpath** statement is really 1,024 characters, not the 256-character limit imposed by most text editors.

If you have a text editor that doesn't force lines to be shorter than 256 characters (many word processors avoid this limit, but don't forget to save *config.sys* back as a plain text file), your standard **libpath** statement can be 1,024 characters long.

48 Avoid the current-path default problem. When OS/2 2.0 appeared, IBM introduced the .; argument to **libpath** as a default. The single period . refers to the current directory, so, because OS/2 placed it as the first argument to **libpath**, when any program needs to load a DLL and does not specify where to load it from, the first place searched would be the current directory. That's good—unless you don't want the current working directory to be the first place searched. Fortunately, by using a new OS/2 Warp setting, **beginlibpath**, you can tell OS/2 to look around *before* using DLLs in the current directory.

49 Use beginlibpath to add directories. The most obvious way to use **beginlibpath** is to type:

```
set
beginlibpath=x:\wherevr;y:\an
other\dir;
```

at an OS/2 prompt to pre-append the **libpath** with these directories for that specific session. When you use this method, the change is for that single session only, and when you close that session, the changes are gone. The same exists for the **set endlibpath** statement, which specifies directories to be searched after the contents of the regular **libpath**.

50 Cancel out beginlibpath. To remove directories specified in **beginlibpath** from the DLL search tree, just type:

```
set beginlibpath=
```

to erase the current **beginlibpath** string. The same goes for **endlibpath**. If you have several directories in either and you want to remove only one, you must retype the string without the directory.

51 Make libpath completely dynamic. Now that we've covered the obvious, there are some things that can make this functional enhancement interesting. Since you can't change the **libpath** specified in *config.sys* at run time, why not replace it with a **beginlibpath** string instead, which you *can* change?

Change the **set libpath** statement in *config.sys* to read **set beginlibpath** instead. When you reboot, your entire **libpath** is in the **beginlibpath** environment variable, and you can modify it as you like at any time on a per-session basis.

52 Use endlibpath, if you prefer. Note that our use of **beginlibpath** is arbitrary; you could choose to use the **endlibpath** variable instead.

Resource Manager Tips

by David Reich

The Resource Manager was introduced in OS/2 Warp to assist both you and OS/2 in identifying, keeping track of, and managing the hardware resources in your computer. The Resource Manager is part of the operating system device-driver processing and has associated code in the OS/2 device drivers. When you start your OS/2 system, the hardware devices are examined to determine what is there to allow many different configurations and assist you in

Table 1: Detailed description of reserve.sys parameters.

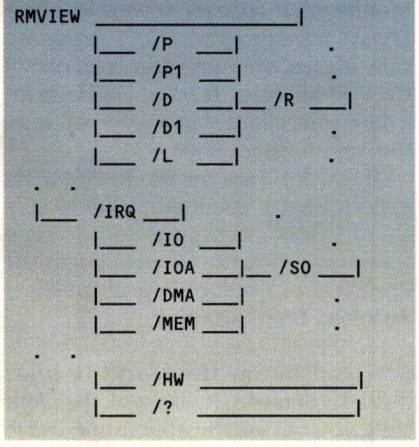
Parameter	Format	Sample	What it does
/IO	/IO:x,y	/IO:340,4	This reserves I/O ports. The first number is the base port address in Hex, followed by the number of ports to be reserved, in decimal.
/DW	/DW:x	/DW:10	Decodes the width of the I/O address. The allowable values are 10 and 16. This switch is only valid in conjunction with /IO.
/P			Performs the same function as /IO
/MEM	/MEM:x,y	/MEM:CA00,1000	This reserves memory addresses. The first number (x) is the base memory address in Hex with the assumption of offset 0. The second number (y) is the length of memory to be reserved, in decimal.
/DMA	/DMA:x	/DMA:2	Reserves a DMA channel. x is the DMA channel to be reserved in decimal.
/IRQ	/IRQ:x	/IRQ:13	Reserves an IRQ level. x is the IRQ level to be reserved in decimal.
/EXC	/EXC	/EXC	Indicates exclusive resource attribute
/MUL	/MUL	/MUL	Indicates multiplexed resource attribute
/SHA	/SHA	/SHA	Indicates shared resource attribute

managing the system.

53 **Use rmview.** **Rmview** is Resource Manager's user interface, which lets you see which hardware is installed and how it's configured. **Rmview**'s syntax isn't in the documentation, and can be seen in Figure 1. All the parameters are optional. If no parameters are entered, **rmview** defaults to the physical view (**/P**):

/P Display the physical view. If no parameters are entered, this view is the default. The physical view displays the physical components in the system, such as adapters, along with the resources claimed by the physical components.

Figure 1: Syntax diagram for RMVIEW.



/P1 Display the physical view with planar chipset devices.

/D Display the device drivers registered with the Resource Manager along with the physical resources and logical devices they claim.

/D1 Display the device drivers with planar chipset devices.

/L Display the logical view of the system resources.

/R Display raw data. When this switch is used with **/P**, **/P1**, **/D**, **/D1**, or **/L**, the Resource Manager data is displayed in a lower-level format.

/IRQ Display the claimed interrupt levels (IRQ), sorted by value.

/IO Display the claimed IO ports above 100 Hex, sorted by value.

/IOA Display all claimed IO ports, sorted by value.

/DMA Display the claimed DMA channels, sorted by value.

/MEM Display the claimed memory regions, sorted by value.

/SO Display **/IO**, **/IOA**, **/IRQ**, **/DMA**, **/MEM**, sorted by owner.

/HW Display the hardware tree. The hardware topology of the system is displayed.

/? The help text is displayed.

Reserve.sys Tips

by David Reich

Reserve.sys is an installable device driver that helps Resource Manager produce more accurate reports. It should be used in conjunction with the Resource Manager in two separate scenarios.

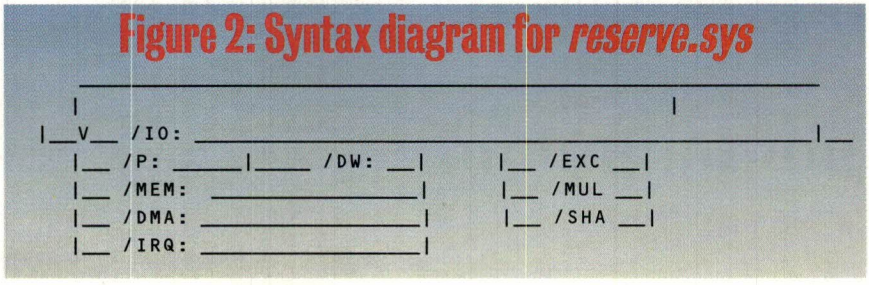
54 **When to use *reserve.sys*.** You'd use *reserve.sys* if you are using a device driver that is not Resource Manager-aware (from sources other than IBM, for example). If you know the resources (such as memory addresses, DMA, and so on) that the device driver uses, you can use *reserve.sys* to reserve those resources so that Resource Manager-aware device drivers will try to gain access to them.

If you have a piece of hardware that does not tolerate its resources being examined, you can reserve those resources by telling Resource Manager to keep away from it.

55 **How to use *reserve.sys*.** To use *reserve.sys*, place the following statement as your first line in *config.sys*:

```
basedev=reserve.sys
<parameters>
```

Figure 2: Syntax diagram for *reserve.sys*



The syntax of *reserve.sys* isn't documented and is diagrammed in Figure 2. The parameters are described in Table 1. The format of these parameters are a bit involved, and are hardware dependent.

Only one resource attribute (**/EXC**, **/MUL**, or **/SHA**) is allowed per resource entry and, if no attributes or decode width is set, the default is **/EXC** with a width of 16.

For example, if you want to reserve **IRQ 13** Exclusive, **DMA 0** multiplexed, memory **CA00:0** for 1,024 bytes shared, I/O ports **340** for 10 ports exclusive and a decode width of 10, this would be the line you add as line 1 in *config.sys*.

```
basedev=reserve.sys /irq:13
/dma:0 /mul /mem:ca00,1024
/sha /io:340,10 /dw:10
```

Hardware settings that are set with jumpers or in CMOS are not changed by the operating system. Some device drivers that are not Resource Manager-aware may need to claim ports, addresses, and so on rather than allowing these Resource Manager-aware drivers to see what is available and go after them. Some devices don't like being probed.

IBM Works Tips

by Lou Miranda

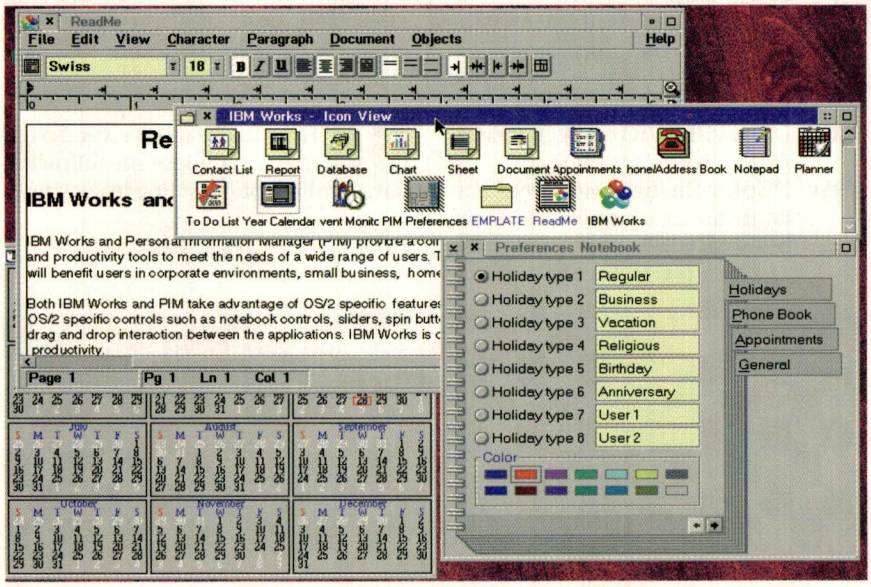
The great thing about IBM Works is that it gives you a reasonable amount of power with an incredibly easy interface—and you can't complain about the price, since it's included in the BonusPak of all versions of OS/2 Warp 3.0 (at least, so far). If you can figure out drag-n-drop, you've pretty much mastered Works.

56 Move an appointment. Want to reschedule today's meeting for tomorrow? Just drag the meeting in the Appointment Book to tomorrow (just remember that you have to select it first with the left mouse button before you can drag it with the right one). Want to schedule a meeting with a coworker? Drag her name from your Contact List to your Appointment Book. Works will even fill in her name and phone number for you.

Drag-n-drop works equally well in Works' other modules. Want to put that chart in your word processor document? Just drag it there, and it'll be updated whenever you update the chart.

57 Use Drag-n-drop for mail merge. Drag a Contact List to a word processor document, and Works will automatically do a mail merge and print or fax the results when you drag the document to your printer or fax object. The first tab in the Settings Notebook of every Works document is a Merge page, which lets you print automatically whenever you drag a name onto it.

58 Start PIM modules by using shadows. It's easy to figure out that you can launch the word processor by just double-clicking on a document object. But the PIM doesn't have any data objects, so what's the easiest way to start the various PIM modules? Easy: Place a shadow of the Monthly Planner in your Startup Folder. Then, to start any other module, just right-click on the planner (outside of the grid area) and select Launch from the menu. Then, just choose which module you want to view. In fact, you can right-click on any of the PIM modules and find the Launch option.


ReadMe
File Edit View Character Paragraph Document Objects Help
Swiss 18
IBM Works - Icon View
Contact List Report Database Chart Sheet Document Appointments hone/Address Book Notepad Planner
To Do List Year Calendar vent Monitc PIM Preferences EMPLATE ReadMe IBM Works
IBM Works and Personal Information Manager (PIM) provide a tool
and productivity tools to meet the needs of a wide range of users. T
will benefit users in corporate environments, small business, home
Both IBM Works and PIM take advantage of OS/2 specific features
OS/2 specific controls such as notebook controls, sliders, spin butt
drag and drop interaction between the applications. IBM Works is c
productivity.
Page 1 Pg 1 Ln 1 Col 1
Preferences Notebook
Holiday type 1 Regular
Holiday type 2 Business
Holiday type 3 Vacation
Holiday type 4 Religious
Holiday type 5 Birthday
Holiday type 6 Anniversary
Holiday type 7 User 1
Holiday type 8 User 2
Color
Holidays
Phone Book
Appointments
General

59 Configure the PIM to dial your phone. Want to customize the PIM? Just right click on one of the modules and choose Launch, Preferences. Up pops a preferences notebook, just like a Settings notebook. Click on the Phone Book tab and you can configure your modem so Works can dial phone numbers for you automatically. If you fill in your local area code here, it'll strip that off your phone numbers before dialing.

60 Define your own user labels. On pages two and three of this notebook, you can define your own User Labels. For example, type in Internet Address in User Label 1. Now, when you open the Phone Book and select the Custom 1 tab, you'll see "Internet Address" as the first field.

You can customize the rest of the user labels by CompuServe address, Relationship (family, friend, client, prospect, or whatever), and even have a check mark for Holiday List.

61 Turn off the Event Monitor. Ever wonder what the Event Monitor that appears in your Window List is? It's a program that's automatically loaded whenever you open one of the PIM modules. It keeps checking for a date/time alarm that you've set up in the Appointment Book.

If you don't use the Works PIM to set appointments, you might want to stop Event Monitor from consuming system resources. Click the General tab in the Preferences notebook, and unselect Autoload Event Monitor.

62 Change the working-hour defaults. If you work the night shift, you can use the Appointments tab

in the Preferences notebook to change the starting and ending time for your workday.

63 **Download the bug fix.** If you plan on using the PIM for important information, I suggest you download the bug fixes for Works. Currently, a beta version is available on the Internet at the Hobbes site. The final fixes may be out by the time you read this article.

Internet Access Kit Tips

by Alexander Antoniades

Once you've set up the Internet Access Kit, you can make a number of small enhancements to get the most out of OS/2 while surfing the net.

64 **Update your IAK.** When you start using OS/2 Warp's Internet Access Kit (and every few weeks after that), it's good practice to use the Update Software icon to ensure you have the latest version of all Internet applications.

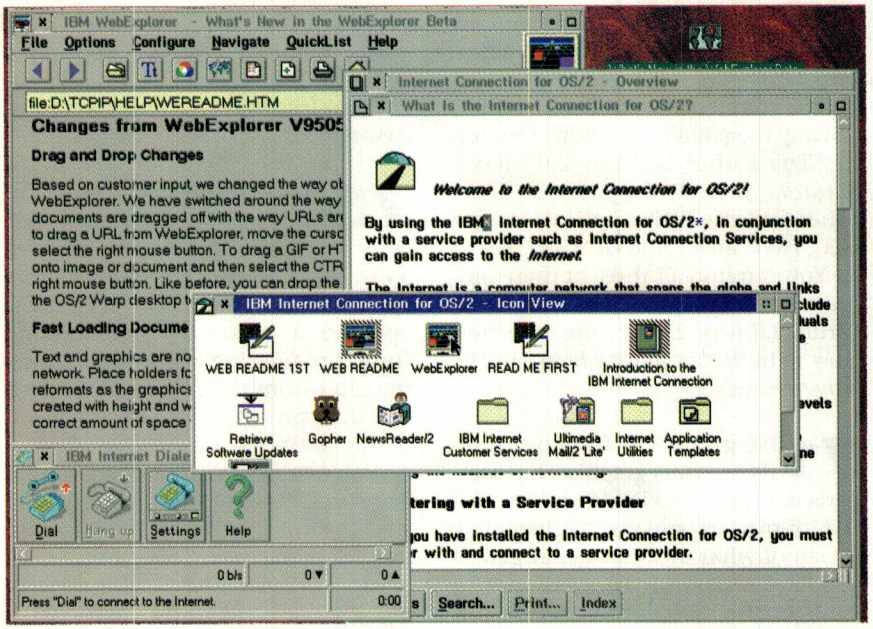
For some reason, IBM moved the Update Software server's address. If your version of OS/2 Warp was released earlier, you'll see an error message or a simple listing that says "Welcome."

Open up the Update Software Settings Notebook and change the parameters after the */h* from *updates .gopher .ibm.com* to *ftp.ibm.net.*

65 **Change WebExplorer defaults.** If you're like most Internet surfers, you'll be using the World-Wide Web browsing tool, WebExplorer. Two options you should set in the Parameters field in WebExplorer's Settings Notebook are:

- **/q** which eliminates the opening logo and confirmation on exit.
- **/t x** where x is the number of pictures to load at once (the maximum is eight, the default is four). You want to tune this for best performance, depending on the speed of your Internet connection.

66 **Use WebExplorer's drag-n-drop.** One of the most overlooked features of the WebExplorer is its ability to interact via drag-n-drop. However, the latest WebExplorer available at press time (1.02) has changed the behavior slightly.


IBM WebExplorer - What's New in the WebExplorer Beta
File Options Configure Navigate QuickList Help
file:D:\TCPIP\HELP\WEREADME.HTM
Changes from WebExplorer V9505
Drag and Drop Changes
Internet Connection for OS/2 - Overview
What Is the Internet Connection for OS/2?
Welcome to the Internet Connection for OS/2!
By using the IBM Internet Connection for OS/2, in conjunction with a service provider such as Internet Connection Services, you can gain access to the Internet.
IBM Internet Connection for OS/2 - Icon View
WEB README 1ST
WEB README
WebExplorer
READ ME FIRST
Introduction to the IBM Internet Connection
Retrieve Software Updates
Gopher
NewsReader/2
IBM Internet Customer Services
Ultimedia Mail/2 'Lite'
Internet Utilities
Application Templates
Dial
Hang up
Settings
Help
Press "Dial" to connect to the Internet.
Search...
Print...
Index

With older versions, any picture on a Web page can be saved by right-click dragging the picture into the Workplace Shell. The HTML-formatted source file can be similarly saved by drag-n-dropping anywhere else.

With WebExplorer 1.02 (and presumably all future releases), you can still drag pictures, but you have to hold down the <Ctrl> key to drag the HTML source. Without holding down <Ctrl>, the drag-n-drop creates a URL object that can be dragged into the WebExplorer to load that Web page. It makes a handy pointer.

67 **Use WebExplorer as a file viewer.** Any file that can be read by the WebExplorer (including text, HTML, BMP bitmaps, and GIF files) can be viewed by dragging it into WebExplorer's main window.

68 **Keep up to date with IAK newsgroups.** Having problems with the Internet Access Kit, or just want to keep up with new developments? Use NewsReader/2 (or your favorite off-line reader) to read the newsgroups most closely relating to the IAK. The best place to monitor is *comp.os.os2.networking.tcp-ip*. It's the main OS/2 Internet area, where most tools are discussed and IAK bugs are reported. A new group, *comp.os.os2 .mail-news*, covers OS/2's Internet mailer and news readers.

69 **Find Internet tools on the Internet.** Check out the growing list of OS/2 Internet tools in one of the many places specializing in OS/2 software:

The OS/2 Internet Apps Web Page is at *http://www.phoenix.net/~vccubed /os2apps.html*. Next, try the LEO (Link Everything Online) OS/2 archive at *http://www.leo.org/archiv/os2/index_group ed.html*. Be patient, since this site is in Germany. And last, but definitely not least, is the Hobbes site, *hobbes.nmsu .edu*, and its mirrors.

Free Software Tips

by Esther Schindler

BBSs and online services can be like flea markets; if you search the contents long enough, you can find a few real bargains. Happily, the quest will produce a treasure trove of OS/2 applications that won't cost you a cent. Nobody has written a free desktop publishing package yet, but several useful applications and utilities are available. Here are some of the best we've found.

70 **Check out IBM employee-written software.** Among IBM's best-kept secrets is its collection of free Employee Written Software (EWS). Apparently, IBMers can't make money from writing software on the side, so if they write a little utility pro-

gram, IBM makes it available for free. (Let's I hope the programmer gets a raise out of it.)

We've mentioned EWS before, notably the popular Extended Desktop in "The Esther Utilities 2.0" (*OS/2 Magazine*, June 1995, pp. 47-52). Three other favorite EWS applications are GFC, PM Camera, and GPSCLOCK.

You can find all three of these programs in CompuServe's OS2USER forum Library 23. On the Internet, they're in *hobbes.nmsu.edu/os2* in the *ibm/ews* directory.

71 Use graphical file compare. GFC is a nifty graphical file-comparison utility. You load two files, and GFC displays a composite file, including a map of what moved or changed. If you have to compare two versions of a configuration file or other text file, this small program will be a serious time-saver. I find the graphical comparison map a little confusing, but at this price, I can live with it. The name of the downloadable file is *os2gfc.zip*.

72 Snap up PM camera. I take a lot of screen shots for articles, so I can justify the expense of a full-scale package such as Impos/2 or Open Shutter. If you need to capture screen images less often, PM Camera will do a more-than-adequate job. Its most useful graphic format is OS/2's native *.bmp*. PM Camera automatically renumbers images, and it lets you control how much of the screen to capture at a time, so it may be all you ever need. The name of the downloadable file is *pmcam2.zip*.

73 It's time for a tiny clock. GPSCLOCK is an example of a tiny but useful EWS utility. It displays the current time in a small box on your screen. It's not earth-shattering, but when you want a clock, you want a clock. This one doesn't take up much real estate. The name of the downloadable file is *clokgs.zip*.

74 Get the EWS catalog. Now that we've got you hooked, you should download the IBM Employee Written Software catalog for a list of dozens of great utilities free for the download—the latest edition has 76 programs listed.

You can find the EWS catalog in the places mentioned earlier. On CompuServe, the file is called *ewscat.zip*. On the Hobbes Internet archive, it's named *ewscat.text*.

75 Make a quick XIT. You can find free OS/2 software in addition to IBM's Employee Written Software, of course. One excellent utility is XIT, which adds a one-click "close application" to your OS/2 applications. Instead of pressing <Alt+F4> or choosing Close from a menu, simply click on the tiny x in the title bar. It sounds minor, but XIT grows on you.

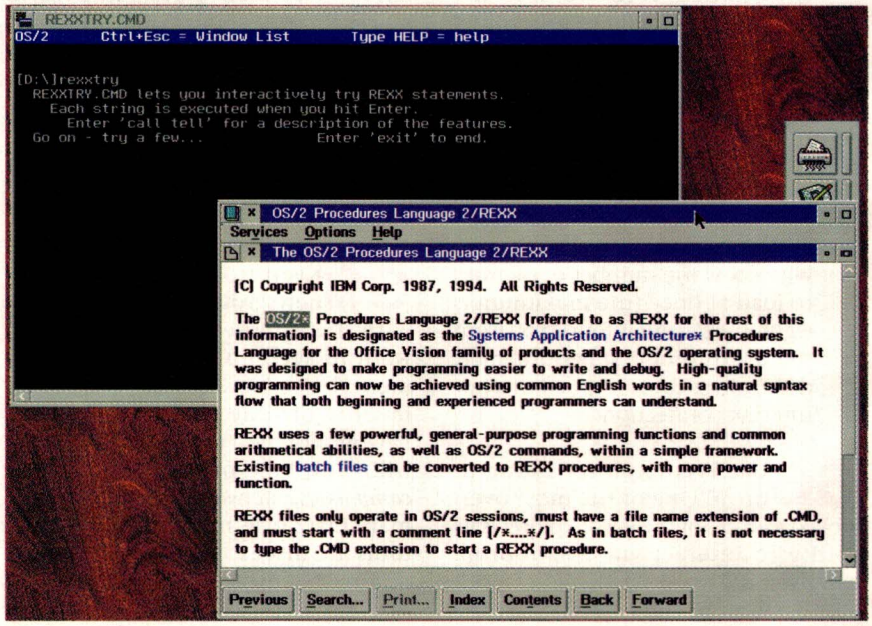
You can find *xit10.zip* in CompuServe's OS2USER forum, Library 5. In the Internet, it's on *hobbes.nmsu .edu/os2* in the *wpsutil* directory.

76 View bitmaps easily with FBMP. Most of us wind up with random files stuck in odd corners of the hard disk, whose names are about as identifiable as the Tupperware full of, er, something in the back of my refrigerator. If you find a rogue *.bmp* bitmap file, you'll find FBMP a quick command-line tool to view it. It's handy, and it's tiny. You can find *fmbp.zip* on the Internet in *hobbes.nmsu .edu/os2* in the *graphics* directory.

77 Zip your files. An essential set of utilities (so ubiquitous that it's easy to forget about them) are the free ZIP and UNZIP utilities. If you've *ever* uploaded or downloaded a file from a BBS or online service, you've encountered zipped files, compressed files created by the computer industry's need to fit 10 pounds into a 5 pound bag. (Zipped files, identifiable by their *.zip* extensions, are based on PKWare's Zip file format. Other PC-based file compression schemes are available, but PKWare has created the *de facto* standard.) Once you acquire them, ZIP and UNZIP will go into your utilities directory, and never leave—unless an update comes out.

You can find both utilities in the self-extracting *unz512.exe* archive in CompuServe's OS2USER forum, Library 4. On the Internet, they're in two files, *unz512x1.exe* and *unz512x2.exe* in *hobbes .nmsu.edu/os2* in the *archiver* directory.

78 Know the UUcode. While you're on the Internet, two more free utilities are the native OS/2 versions of UUdecode and UUencode. These utilities help to convert and extract files to the popular uuencoded file format that allows binary files to be exchanged over the Internet either via mail or the binary Usenet newsgroups. You can find *ucode101.zip* on the Internet on *hobbes.nmsu.edu/os2* in the *archiver* directory.


REXXTRY.CMD
OS/2 Ctrl+Esc = Window List Type HELP = help
[D:\]rexxtry
REXXTRY.CMD lets you interactively try REXX statements.
Each string is executed when you hit Enter.
Enter 'call tell' for a description of the features.
Go on - try a few... Enter 'exit' to end.
OS/2 Procedures Language 2/REXX
Services Options Help
The OS/2 Procedures Language 2/REXX
(C) Copyright IBM Corp. 1987, 1994. All Rights Reserved.
The OS/2 Procedures Language 2/REXX (referred to as REXX for the rest of this information) is designated as the Systems Application Architecture Procedures Language for the Office Vision family of products and the OS/2 operating system. It was designed to make programming easier to write and debug. High-quality programming can now be achieved using common English words in a natural syntax flow that both beginning and experienced programmers can understand.
REXX uses a few powerful, general-purpose programming functions and common arithmetical abilities, as well as OS/2 commands, within a simple framework. Existing batch files can be converted to REXX procedures, with more power and function.
REXX files only operate in OS/2 sessions, must have a file name extension of .CMD, and must start with a comment line (/*....*/). As in batch files, it is not necessary to type the .CMD extension to start a REXX procedure.
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79 Clear out the single input queue. Another utility that is now shareware, but still has a valuable freeware component is a program called WatchCat. This program uses low-level system calls to overcome the Workplace Shell's single-input queue limitation when the WPS has crashed. By hitting <Ctrl+Alt+W> (or any other key combination that you define) WatchCat launches a character-mode application that can kill or monitor any process that is running. This utility has allowed me to recover from otherwise terminal situations on more than one occasion. You can find *wcat21.zip* on the Internet on *hobbes.nmsu.edu/os2* in the *wpsutil* directory. Be sure to check out the WatchCat home page at *http://www.uni-passau.de/~normann /watchcat.html*.

REXX coding tips

by Dick Goran

While REXX is a very simple and comfortable language in which to write programs, that flexibility can lead the unwary programmer into a trap.

80 Learn the three concatenation methods. REXX allows three types of concatenation (linking together) of strings. The concatenation operator of two vertical lines (||) results in the strings preceding and following the operator to be concatenated as they exist. A space serves as the second concatenation method. When one or more spaces appears between two strings, REXX concatenates those two strings with a single space between them.

The third type of concatenation is known as abuttal concatenation and causes programmers the most difficulty. When two terms are written together without any intervening space or operator they are said to abut. In the following example:

```
'$'123 name'.'ext
```

the literal string '**$**' is abutted to the string **123**, the contents of the variable name are abutted to a period, and that string is abutted to the contents of the variable **ext**. This ability can be very convenient but, at the same time, cause a problem. The following examples will not necessarily lead to the strings you might expect:

```
'123'b 'FACE'x '789'e'12'
```

Each of these strings represent special cases where abuttal concatenation does not work in the traditional sense. The first two examples are the notation used to specify a binary and hexadecimal value respectively. Therefore, abuttal concatenation does not apply. In the first example, the REXX 15 error code will be raised since the value **123** contains an invalid binary string. The second example yields a 2-byte hexadecimal string rather than the value "**FACE**" abutted to the contents of the variable **x**, as might be expected. The third example results in a floating-point number rather than the numeric strings being abutted to either side of the contents of the variable **e**.

81 Learn when to use leading zeros. When are leading zeros preserved in REXX? How can they be presented as the leading characters of a numeric string? Leading zeroes will always be dropped on any numeric assignment in REXX. Assuming:

```
x = '0001'
```

x = x will yield the same four-character string. However, **x = x + 0** will result in a one-character string containing just the character **1**. To restore the leading zeros to the value contained in **x**, the **RIGHT()** built-in function comes in handy. The third, and optional, parameter to the **RIGHT()** function is a padding character that pads the resulting string when the value used in the function is shorter than the specified length. Therefore:

```
x = RIGHT( x + 0, 4, '0' )
```

will result in the value assigned to **x** always having high-order zeros when appropriate.

If you are as style conscious about your code as I am, the **RIGHT** function could be used in the code shown in Fragment 1 so that the labels **ROUTINE_1** through **ROUTINE_9** could be written as **ROUTINE_01** - **ROUTINE_09** and the expression used to create instruction would be:

```
instruction = 'call ROUTINE_'
|| RIGHT( index, 2, '0' )
```

Fragment 1: Computed "Go To"

```
/* Format 1 */
if index = 1 then call ROUTINE_1
if index = 2 then call ROUTINE_2
    ...
if index = n then call ROUTINE_n
/* Format 2 */
select
   when index = 1 then call ROUTINE_1
   when index = 2 then call ROUTINE_2
        ...
   when index = n then call ROUTINE_n
   otherwise
...end
/* Format 3 */
instruction = 'call ROUTINE_' || indexinterpret instruction
```

REXX Function Tips

by Dick Goran

82 Exploit the INTERPRET Instruction. Many programmers overlook the power of the **INTERPRET** instruction. Though this instruction can be easily abused since it can make programs difficult to follow, in some circumstances, it is quite appropriate to take advantage of its capabilities. Compare the three techniques shown in Fragment 1. Each accomplishes the identical task.

Using the **INTERPRET** instruction results in simple code that makes up for the inability to specify a routine name as either the contents of a variable or the evaluation of an expression as can be done with the **SIGNAL VALUE** expression instruction.

83 Understand RXQUEUE() vs. RXQUEUE. Much of the con-

fusion about external REXX data queues results from the unfortunate choice to name the OS/2 **RXQUEUE** subcommand the same as the much older built-in **RXQUEUE()** function.

The **RXQUEUE()** built-in function is used within a REXX program to create and delete queues, to make a specific queue the active queue, and to get the name of the currently active queue. The OS/2 **RXQUEUE** subcommand is used to store data in a REXX data queue (either first-in, first-out or last-in, last-out) or to clear any data in a queue. **RXQUEUE** is external to any REXX program and can be run from a command line or as an external command from within a REXX program.

Each OS/2 session has, by default, a REXX external data queue named **SESSION**, which is private to that session. Only one data queue is active at any one time. You use the **RXQUEUE()** function to set the currently active queue. It is the programmer's responsibility to create, and hopefully delete, any other required queues. Any other queues can be referenced from any OS/2 session that knows the name of the queue. A REXX program can test a queue for the presence or absence of data using the **QUEUED()** function, which returns a Boolean value of 0 or 1 denoting the absence or presence of data. On other platforms, **QUEUED()** may return the number of lines of data currently in the queue. Therefore, it is a good idea to test the value returned by **QUEUE()** for a value of zero or greater than zero.

Data can be piped to a REXX data queue. For example, to place the output of a **DIR** command in a data queue you could use:

```
DIR *.* | RXQUEUE
```

However, since a **DIR** command can return an error message if there are no files that meet the file-mask criteria, it is also necessary to pipe the output of **STDERR** (the file handle that receives the error message). This can be accomplished with:

```
DIR *.* 2>&1 | RXQUEUE
```

where the **2** represents the file handle for **STDERR** and the **1** represents the file handle for **STDOUT**. This notation tells OS/2 that they are to be directed to the same place. In this case, they will be piped to the **RXQUEUE** pipe or subcommand.

Miscellaneous REXX Tips
by Dick Goran

84 Watch for the double-slash problem. REXX creates a tokenized format of your program if the tokenized format doesn't exist or if the tokenized format is older than the source program. The handy facility to tokenize the program only, without executing it, exists and can be specified with the characters **//t** following the program name on the command line.

This capability has resulted in an overall OS/2 problem. Since *cmd.exe*, the command interpreter, grabs anything following a double slash, it is currently impossible to pass any text string beginning with a double slash to a REXX program (or any other program for that matter) from the command line.

This presents a serious problem, since all Internet World Wide Web universal resource locators (URLs) except news contain a double slash, such as the WWW page *http://www.cfsrexx.com*.

85 Fix the file-handle fix that didn't. OS/2 Warp contains a fix to OS/2 2.1 that caused numerous REXX programs to break. Namely, OS/2 2.1 with multimedia extensions (MMPM/2) installed changed the default number of file handles within each session from 15 to 80. OS/2 Warp restored the default value to 15.

If you have a program that opens numerous files and works fine under OS/2 2.1 but fails under OS/2 Warp, you may have bumped into IBM's fix.

First, the program should be corrected to close a file when it is through with it, thus releasing the file handle resource. In many cases, this might be all you need to do.

However, if you have a need to have more than 15 files open concurrently, your only choice is to resort to a third-party routine (or write your own C DLL) to increase the number of per-session file handles.

86 Learn to love the REXX exit message. There is no way to eliminate the "The REXX procedure has ended" message produced by PMREXX. This message is hard-coded into PMREXX and is one of the reasons for PMREXX being disregarded by many REXX programmers.

87 For advanced math, use RexxMath. All arithmetic operations in REXX are handled internally within the interpreter and do not take advantage of an available math coprocessor. Therefore, if you have a need for complex computations in REXX, use a third-party package such as RexxMath. You'll find it in CompuServe's OS2DF1 forum, Library 7, as *rexxma.zip*, and elsewhere as *rexxmath.zip* .

88 One good pipe deserves another. If you are passing a command to the external environment of a REXX program, such as a **DIR** command, with the intent of either redirecting that command's output to a file or piping it to **RxQueue**, be sure to redirect or pipe the output of **STDERR**. For example:

```
'@dir *.* 2>&1 | RXQUEUE'
```

89 Find REXX info on the Internet. When you want to know what is happening in the world of REXX or if you have REXX-related questions, here are some resources.

The father of REXX, Mike Cowlishaw, maintains a World Wide Web site on the Internet at *http://www2. hursley.ibm.com* that can lead you to other sources of REXX information.

Another new REXX site on the Internet is my own *http://www.cfsrexx .com*. CompuServe's OS2DF1 forum, Section 6, and the Usenet's *comp .lang.rexx* newsgroup are other places to find quick answers to your questions.

Miscellaneous Tips

90 Bypass the Hobbes bottleneck. Arguably the best source of OS/2-related files is on the Hobbes ftp site, *hobbes.mnsu.edu*, under the */os2* directory tree. You can access this site using the FTP-PM program, or through WebExplorer as *ftp://hobbes .mnsu .edu/os2*. Unfortunately, the Hobbes site can currently support only 200 concurrent users, and that's simply not enough given OS/2 Warp's popularity.

You can use any one of four mirror sites instead of the official Hobbes sites; they have the same files, in the same locations:

Sounds like you could use CompuServe's OS/2 interface about now.

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If you don't have Internet access, the alternative is to purchase the Hobbes archive CD-ROMs offered by Walnut Creek CDROM (510) 674-0783, fax (510) 674-0821, e-mail *info@cdrom.com*. Although affordable, these discs aren't as current as the instantly updated Hobbes Internet archives.

91 **Check out some free EPM files.** If you enjoy customizing the EPM, try the friendly Enhanced Editor or, if you'd like to learn more, download the macro source and EPM REXX examples. The files are called *epmmac.zip* and *epmrex.zip*, and they're in CompuServe's OS2USER forum, Library 23, or in the Internet Hobbes archive, *hobbes.nmsu.edu/os2* in the *ibm/epm* directory.

You can also find a few interesting EPM extensions online in Hobbes's *editors* directory, shown in Table 2. *Bill Schindler*

92 **Using REXXTRY.** There have probably been instances where you have wondered exactly what form the data returned by a function would be in. Perhaps you have wanted to do a quick calculation that caused you to write a one or two-line REXX program. The solution: use REXXTRY.

REXXTRY is actually *rexxtry.cmd*, and is an interactive method of running and executing REXX statements from an OS/2 command line. Try it from a full-screen or Windows OS/2 prompt:

```
rexxtry say( 2 * 3 )
```

REXXTRY will be launched and will interpret the instruction **say(2 * 3)** with the resulting answer **7** being displayed. Similarly, if you are not exactly sure what the form of the data returned by the **parse version** instruction is, launch REXXTRY and enter the following:

```
parse version x
say x
```

and you will see the result:

```
REXXSAA 4.00 10 Feb 1994
```

Dick Goran

93 See the device drives with <Alt+F2>. After the power-on self test, and after you acknowledge the Boot Manager menu, you see a small white block and "OS/2" next to it in the upper left corner of the screen. When you see this, you can press <Alt+F2> to cause all of the device-driver load messages to appear and scroll on the screen.

Several releases ago, the OS/2 developers changed the default behavior of the system to not display all of the device-driver status messages. The only time the logo screen disappears is when a device driver displays a message or when the Workplace Shell desktop is about to paint itself. The device drivers shipped with OS/2 do not write any messages to the screen unless an error occurs or you use <Alt+F2>. *David Reich*

94 **Get to the Settings Notebook faster.** A shortcut to pulling up an object's Settings Notebook is to hold the <Alt> key down while double-clicking on the object whose Settings Notebook you want to work with. *David Reich*

95 **Formatting FAT over to HPFS.** To reformat a FAT disk partition as an HPFS partition, the command is:

```
FORMAT X: /FS:HPFS
```

where **X** is the drive you want to format. Likewise, if you have an HPFS drive that you want to reformat to FAT, type:

```
FORMAT X: /FS:FAT
```

If you don't enter the **/fs:** parameter, the **format** program will default to reformatting the drive with the file system that is currently on the drive. If no file system is found (if you just repartitioned a physical drive, for example) and you do not specify a file system, **format** will assume you want FAT. If the disk partition contains data, don't forget to back it up first! *David Reich*

96 **REXX function for directory testing.** Neither the OS/2 REXX built-in functions nor the **REXXUTIL** external functions provide a single method to test for the presence or absence of a directory. Here's a function that you can save to a directory that is within your path:

```
/* ExistDir.CMD - Pseudo
ExistDir Function */
ExistDir:parse arg directory  /*
get directory name from caller */
call SysFileTree directory,
directory_stem, 'D'if
directory_stem.0 = 1 then return
1 return 0
```

Dick Goran

Table 2: The Hobbes's editors directory.

epm_spel.zip	Spell checker add-in for EPM editor
gcppgp10.zip	EPM Front End for OS/2 PGP 2.6.x
htmlepm.zip	HTML extensions for EPM (version 0.95)
mlepm.zip	Hooks, highlighting, and more for EPM
Some are in the *ibm/epm* directory:	
epmbk.zip	Technical and user documentation
epmmac.zip	EPM macros
epmrex.zip	EPM REXX sample macros
And one is in the ibm/ews directory:	
cstepm.zip	Adds an actions menu

—Bill Schindler

Windows 95 tips

By Lou Miranda

If you believed all the hype surrounding Microsoft's Windows 95, you might think it can do everything that OS/2 Warp can do and more—especially when it's had three years to catch up. Peek below its snazzy interface, however, and you'll see that Windows 95 looks more like OS/2 Warp than acts like it. These tips, by the way, are based on the Windows 95 beta, not the final release (not yet out at press time).

97 **Win95: Forget customizing individual folders.** Surprising as it may sound, you can't customize

individual folders in Windows 95. In OS/2 Warp, simply pop-up the folder's menu and select Settings. On the first three pages, you can change the font, text color, and background color. Select the Background tab, and you can change the color or add a bitmap. You can even add menu items on the Menu page of the Settings Notebook.

Why would you want to customize? To really take advantage of OS/2 Warp's features, group your folders by project, instead of by application. For example, you might have a Home folder and a Work folder. The Home folder has data files for personal letters, finance, recipes, and such, and the Work folder has data files for task lists, spreadsheets, sales letters, and the like. You could then customize each of these two folders with a different background color and icon.

What about applications, such as most utilities, that don't have associated data files? Just add them to the popup menu for your Home or Work folder. For example, add your PIM to the menu for your Work folder, and DOOM to the menu for your Home folder.

98 Win95: Forget using Work Areas. You might also make your Home and Work folders into Work Area folders. This Settings Notebook option (under the File tab) will turn your folders into mini-desktops. Minimizing, closing, or opening your Home or Work folder will minimize, close, or open all the open documents in that folder. In the Settings Notebook for a folder, just select Work Area on the File tab.

99 Win95: Forget using the Light Table. Another neat folder trick that Windows 95 doesn't have is Light Tables. Just drag a light table template out of your Templates folder. Then, select a few multimedia files (*.tiff*, *.gif*, *.bmp*, *.wav*, *.midi*, or *.avi* files work great) and select Create LT Reference from the popup menu.

Open the Light Table and you'll see thumbnail images. Double-click on an image to open it up, or double-click on the slide frame surrounding each image to get a quick view with OS/2 Warp's multimedia viewer.

100 Win95: Forget document-centric computing. Microsoft touts Windows 95's document-centric capabilities, but OS/2 Warp far outshines it here too. For example, once you tell Windows 95 to associate a file type with an application (for example, **.bat* would be associated with *command.com*), you can't use the popup menu to open that file with any other application.

How does OS/2 Warp make it easier? Let's say you want to run *setup.bat*. In either OS/2 Warp or Windows 95, you can simply double-click on the icon. But what if you want to edit *setup.bat*? You can't, directly, in Windows 95. In OS/2 Warp, right-click to bring up the menu, then select Open System Editor. In fact, you can make as many associations as you like.

101 Win95: Forget evolving past file extensions. Windows 95 only lets you associate applications and data by referring to their three-letter file extension. OS/2 Warp's Extended Attributes (EAs) allow you to define files as a certain type no matter what you name them.

For example, you can name an IBM Works document anything you want—with any extension you want—because it has an EA that tells OS/2 Warp that it's an IBM Works document.

102 Win95: Forget searching by file comment. OS/2 Warp's Extended Attributes also give you the ability to attach notes and keywords to a file. Open the Settings Notebook for any file. Choose the File tab, then move to page 3. Enter some comments and keywords, then close it. If you ever need to find that file, you can use the Find option on any folder's popup menu to search by comments or keyword.

103 Boot Windows 95 under OS/2 Warp. Everyone except Microsoft admits that Windows 95's text mode is really just plain good DOS. And just to show yourself how much like DOS it really is, try this: Take a Windows 95 boot disk and place it in drive *a:* on a PC running OS/2 Warp. Now double-click on the DOS From Drive A: icon in the Command Prompts folder. You guessed it: Windows 95 text mode appears.

They'll work for tips.

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ColorWorks for OS/2

Painting and processing with power. BY GUY WRIGHT

Serious graphics people have had little to choose from when looking for professional quality OS/2 paint and image manipulation tools, but now, SPG is shipping ColorWorks for OS/2. The program is one of few truly OS/2 optimized applications and this thinking can be found throughout the program. All aspects of ColorWorks are fully Workplace Shell-enabled and multithreaded. Everything can be dragged and dropped, most of the options have Settings Notebook controls, and you can even adjust the behavior of threads. But beyond the refreshing "designed for OS/2" look-and-feel, the program has an impressive feature set.

Installation is quick and painless and the manuals are very comprehensive. When you first launch the program, you will see a typical graphics program interface with tool bar, menu bar, color palettes, information bar, and an area in which to open images (canvases). From this point on, the program begins to show where it goes beyond a mere paint program. For example, the tool bar can be configured vertically or horizontally, using either icons or text. Double-clicking on any of the tools brings up the Tools Notebook, where you will be presented with page after page of settings and options. You may never use half of these options, but it's nice to know that, if you wanted to adjust the zoom ratio or have text flow from right to left, there is a way to set it in a notebook. The lower left corner of a canvas window contains a progress bar and the lower right corner contains an information gadget that can display the progress of operations, give you detailed information about the image (file type, image size, resolution, colors, even the type of compression used), and let you set the thread priority levels for the particular canvas. This last option is useful when you have multiple image canvases open and want to relegate a lower priority to time-consuming tasks for background canvases. The bottom of the screen displays xy pointer coordinates (or color info) and an info bar that displays help on identifying and using tools and other elements of the program.

When you open an image or create a new canvas, you can set the display palette depth (very handy for working on 24-bit images in an 8-bit video display environment). ColorWorks can handle *.bmp*, *.gif*, JPEG, *.pcx*, *.pict*, TARGA, and TIFF (and can save EPS as well). During saves, you can adjust the JPEG compression levels, where appropriate. This is a good start, but most high-end image processing packages support more file formats. When loading or starting a new canvas, you can also set Dynamic In-memory Image Compression (DIMIC) on or off. DIMIC is a technique where images and undo/redo states are saved in RAM in a compressed format. It allows you to open more or larger image files and, in some cases, can speed up processing by avoiding virtual RAM slowdowns.

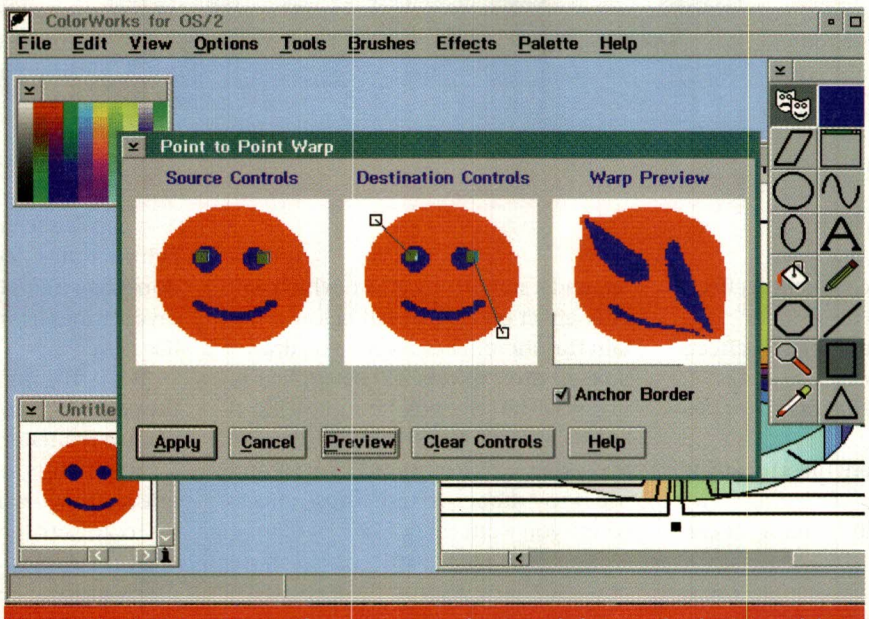

Figure 1: The point-to-point warp function gives you fine control of start and end points, and the preview feature lets you experiment before drawing.

Once you have a canvas open, you can adjust effects pertaining to color in any of up to four ways; RGB (red, green, blue), CMY (Cyan, magenta, yellow—sorry folks no K or black), HSB (hue, saturation, brightness), or HLS (hue, luminosity, saturation). Depending on the type of work you are doing, one of these options should fit

the bill. You can also set panning/scrolling speed, the type of cursor, repaint methods, interpolation methods, and even set the number of processors you have in your SMP setup. For images, you can set tonal ranges for shadows, midtones and highlights, set protection masks, examine edges, and even adjust your monitor's gamma settings. (The manual contains a fairly good little section on how to calibrate your monitor.)

Features and more features

ColorWorks has so many features and settings that listing them would fill this review. I won't list them all, but for those who are curious, here are a few:

- Up to 255 levels of undo/redo (user-defined)
- 20 zoom levels (also user-definable)
- 17 Coon's Warp settings included (and the ability to create your own)
- 35 brush shapes (but you can turn anything into a mask [brush])
- 175 effects
- 6 predefined color maps (but you can create your own)
- 5 predefined smoothing effects (or create your own)
- 6 predefined sharpening effects (or create your own)
- 8 predefined noise reduction effects (or create your own)
- 7 predefined edge detection effects (or create your own)
- 31 predefined special filters (or create your own)
- 8 predefined custom filers (or create your own)
- 19 predefined texture maps (or create your own)
- 12 predefined pixel displacement maps (or create your own)

We can take a look at a few of the more interesting ones in a little greater detail but first, let's look at the way ColorWorks uses and applies effects. For the most part, when you work on an image, you will be working with masks. A mask can be any shape or size you want and, like everything in ColorWorks, you are offered dozens of settings, adjustments, and options. If it makes it any easier to visualize, you can think of masks as custom brushes that you define from an existing canvas image.

The next concept that is extra-special in ColorWorks is that you can define multiple filters, effects, and merging options and have them all applied at once. For example, you could set a posterize effect, a custom filter, and a smoothing effect, which will only effect pixels that fall below a certain threshold. Then, when you draw a box, all three effects will be applied to pixels within the box boundaries and below the set threshold. You could apply these same settings to a mask and use it to "rubber-stamp" those effects where you want them.

To make this feature even more powerful, let's say you have created a combination of settings you like. You can save the settings "state" to disk for later use. Finally, just about every filter and transform option has a preview box so that you can see a snapshot of how the effect will alter your image.

Of course, you can create a mask from one canvas and apply it to others. ColorWorks also provides multiple methods of dictating how a mask is merged with an image with settings for percentage, soft/hard edges, add pixels, subtract pixels, multiply, only when lighter, only when darker, or any HLS range. One nice feature of mask merging is that you can distort a mask by merging it into a specific shape. For example, a parallelogram shape will give a skew effect to the mask. It is really a transform and could even be considered a kind of warping. Which brings us to warping or morphing.

When you create a mask, you can warp the image (in multiple ways of course). Apart from merging a mask with a shape, ColorWorks provides two main warping controls: Coons Warp and point-to-point. The Coons Warp option brings up a requester with two boxes, one with the mask graphic for previewing and one with four curves along the edges. By moving the curve segments, you modify the warp mask (the 17 predefined warp masks include settings such as wave, nightmare, cylinder, and so on, just in case you don't feel like playing). And you can save settings if you find something you like.

But if that isn't enough warping, try the point-to-point warp. Point-to-point opens a requester with three boxes, one for start points, one for end points and one for previewing. Here, you can set up to 26 start-end lines, which gives you very detailed control over the morphing process. For example, you could specify that the left eye moves up just a little while the right eye drips far down like a melting wax monster from an old

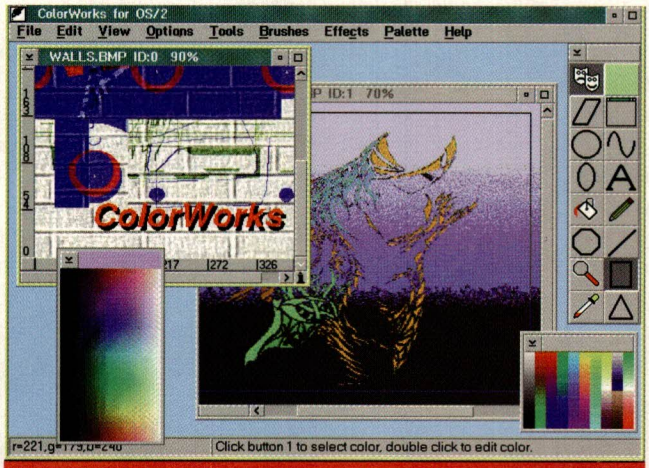
ColorWorks for OS/2
File Edit View Options Tools Brushes Effects Palette Help
WALLS.BMP ID:0 90%
ColorWorks
Click button 1 to select color, double click to edit color.

Figure 2: The Colorworks main screen with multiple open canvases, toolbars, and palettes.

Hammer Film.

Among the various filters, you will find the standard posterize, sharpen, blur, texturize, and pixel-displacement effects and, as with everything in ColorWorks, each of these filters have a number of predefined settings. If you don't like them, you can control dozens of settings and possible adjustments.

Two other features are both unique and very useful. Multiprocess gives you multiple views of the same canvas (you can work in either and effect them both), which is very handy for keeping an eye on a finished canvas while you are working on it in another window. The other is a clone, which allows you to paint on one canvas with pixels from another image.

The good stuff

By now you have gotten the idea that ColorWorks is a feature-laden image-processing program. It is indeed one of the richest programs of this sort on any platform. It is not only extensive in its predefined effects and transforms but it goes much further than other programs in allowing the user to customize and modify just about everything.

ColorWorks is also a very well thought out program, in that most of the features, bells, and whistles are easy to get to and intuitive to implement. Buttons, boxes, sliders, and all the rest are clean and make sense. These features may seem minor, but if you have tried to use a program that is not designed well from a user interface standpoint you can appreciate clean design.

The manuals are clear and well organized with dozens of useful hints and tips. For the most part, the program installs and behaves very well (I managed to crash it a few times, but was pleasantly surprised when I restarted the program, tried a paste operation, and found my previous image still in the copy buffer).

Overall, the program is definitely a professional quality product with the added bonus that it only consumes about 1 MB RAM, freeing up the rest of your system for images.

The annoying stuff

A million options are handy when you need them, but if the program is difficult to use, the options buried too deep, or performance is slow, then a program becomes more of a burden to use and gets relegated to the "occasionally used utilities" folder. ColorWorks suffers from a bit of all of these setbacks. With so many options to choose from and all of them applied with different settings, it is easy to get lost, apply something, realize that you had some effect turned on, and have to start over. Here is where the 256-level undo/redo comes into play. You will probably be using the undo/redo not so much to correct drawing errors as to remove some unintentionally applied effects.

With so many effects, transforms, filters, and settings, expect to spend a great deal of your time with the manuals. It is easy to forget where exactly a particular setting is hidden and even though 80% of the commonly used settings are only one or two clicks away, when you have hundreds of settings to choose from, that means dozens are buried a little deeper.

Another small annoyance is the help system which, while, for the most part is omnipresent, gives rather vague information that sounds more like marketing hype than step-by-step help. This system is frustrating when you just want to find out how to move something and instead are treated to multiple paragraphs about how easy, flexible, and powerful the move options are.

ColorWorks is a powerful image-processing package, and even though you can save individual processes or entire sets of processes, I wondered why it doesn't have any batch-processing facilities. In image-processing situations, it is common to have a group of images that all need the same transformation or effect and it would be nice to specify a list of images and let ColorWorks do the rest.

Finally, even though you can tweak the processor, threads, compression, levels of undo and assorted other performance-related items, ColorWorks is still slow, nearly too slow to use the freehand draw effectively for anything like drawing, even without any effects in place. With effects enabled, ColorWorks slows to a crawl on a 66MHz 486 with nothing else running. This may or may not be a problem depending on how you use the program, but it will probably be an annoyance no matter what you do. For this reason, most people will focus on using ColorWorks purely as an image-processing program, not a paint program.

Conclusion

ColorWorks is a professional quality, high-level image-processing program with more features and customizing options than any three other programs. It is both great and confusing. It makes good use of OS/2 in implementation and by taking advantage of the multitasking and multiprocessor features. It is well designed and well implemented, easy to install, easy to use, and very, very powerful. If you are looking for a paint program, you might look for something with fewer features but faster drawing response. Overall, I would have to rate ColorWorks as one of the best applications currently available for OS/2 that just might have enough meat and sweet stuff to attract graphics professionals from other platforms.

Guy Wright is the Executive Editor of OS/2 Magazine.

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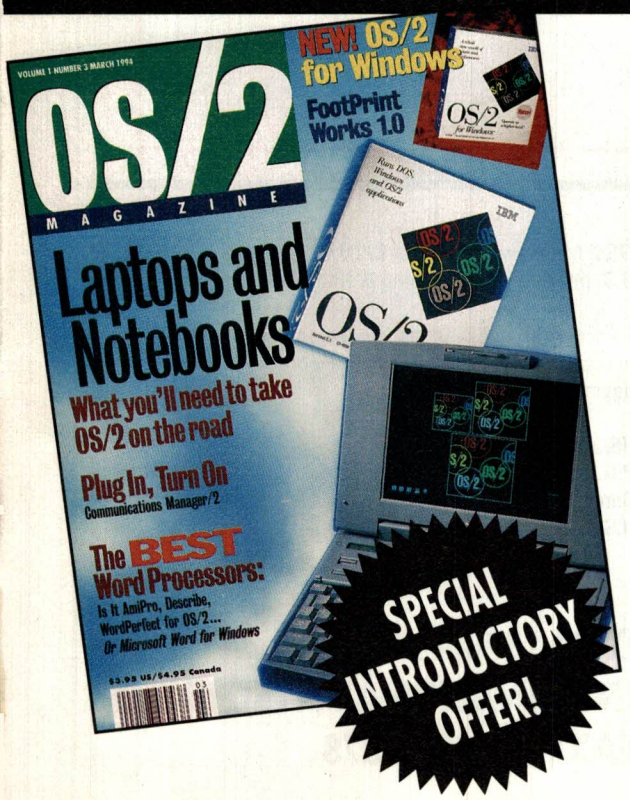
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FileStar/2

OS/2's Missing Link. BY GEOFFREY HOLLANDER

It is an amazing oversight, really, that OS/2 has released several versions, from 2.0 to Warp 3.0, without a file manager. If you manipulate files every day—either for yourself or your clients—you're acutely aware of this omission. The only thing that seems stranger is that someone hasn't come up with a good utility to provide this missing link—until now. FileStar/2 1.0, from SofTouch Systems, is a classic file manager that is simple, fast, powerful, and neatly fills this gap. The familiar file manager interface is not only helpful to new users making a transition from the DOS and Windows environment to the OS/2 Desktop, but also offers real file power to advanced OS/2 users who need extended control over their files.

FileStar/2 centers around a two-window display to view drive and directory contents, while providing full drag-and-drop capabilities. Move or copy files between windows, as well as other Workplace Shell objects (dragging a file to a printer or the shredder, for example). FileStar/2 is a complete 32-bit, multithreaded OS/2 application in which it's possible to run different operations in each of its two windows at the same time. You can, for example, copy a set of files from one directory to another while simultaneously archiving files in a third directory.

The FileStar/2 display is virtually a file-management control center. The Data Panel, along the bottom of the screen, provides information about the selected drive volume, directory, and files, including: Name, Size, Date Stamp, Time Stamp, and Attributes. It also provides a dynamic Message Window at the bottom (to the left). When no operations are in progress, you can click the right side of the Message Window to clear any messages, and click on the left side to display the swapper file size. All displayed messages are stored by FileStar/2 and can be reviewed in a Message History dialog box by selecting "Message..." from the Windows section of the pull-down menu. Special buttons along the top of the status area will help you change the Name, Attributes, and Date or Time Stamps of any selected file.

Above the Data Panel, in the main section of FileStar/2, the drive, directory, and file windows are displayed. Typically, the program defaults to a vertically tiled window layout, with a drives window on the left, a directory window to the right and, successively, two more file windows to the right of that. If you're not happy with that way of looking at your files, simply change it to one of the other two pre-designed window configurations—horizontally tiled file windows and cascaded windows—or design your own custom window pattern. At any time, you can toggle through the various window modes by clicking on the Window Toggle pushbutton at the lower left corner of either file window.

Located immediately above the main window section, the handy Button Bar extends horizontally across the whole FileStar/2 window. The button Bar provides quick access to these common actions: OS/2 (Window), DOS (Window), FreDir (frequently used directories—a user-defined list), LastDir (last used directories—a list of the most recently used directories), Edit, Copy, Move, Print, Delete, Filter, Find, and Help. Copy,

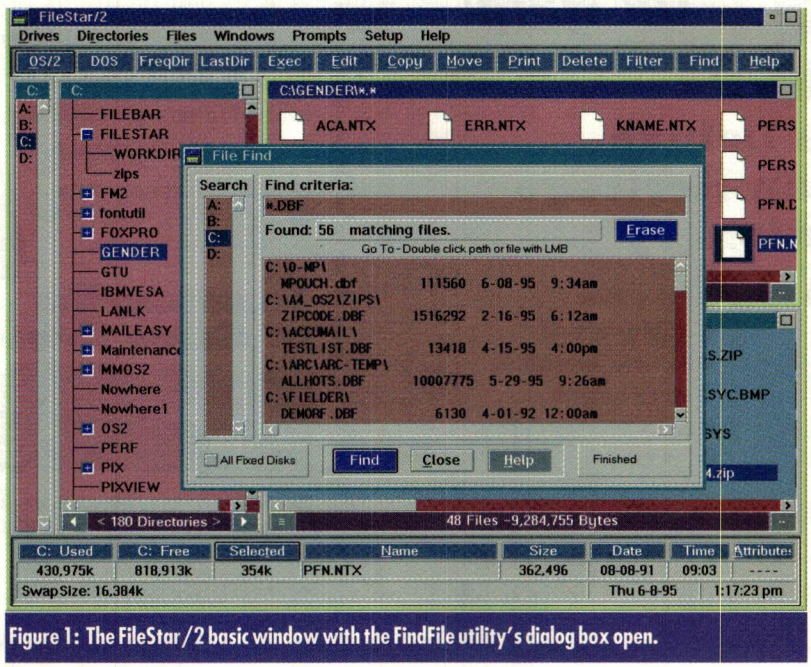

Figure 1: The FileStar/2 basic window with the FindFile utility's dialog box open.

Move, Delete, and Filter operations are window dependent, acting on directories and files in FileStar/2's active windows. Based on your preference, the Button Bar can be displayed or hidden.

SofTouch includes InfoZip's Zip /Unzip archiving utility for easy access to file compression. A quick setup in the FileStar/2 Settings Notebook will tell the program where to find the zip and unzip utilities. A ZipView Window can be activated by clicking on any zip file that shows the following information: filename within the zip file, uncompressed file size, last write date, last write time, percentage of compression, compressed file size, and method of compression. While, for the most part, FileStar/2 handles this phase of file management well, unfortunately it will only support compression using InfoZip's product. To give users more flexibility, especially if compressed files need to be given to DOS or Windows-based clients, FileStar/2 should be able to support compression using other well-known utilities such as Pkzip/Pkunzip for DOS. Associations are limited in this application, as well. Although you can associate an editor, file viewer, image viewer, and the InfoZip utilities with certain file extensions through the Settings Notebook, it would be nice to configure some on the fly, especially *.dbf* with Alpha Four or DB Expert, DeScribe files (no extension) with DeScribe, and so on. A configurable Button Bar and Menu system would also be valuable additions to FileStar/2.

If you've ever wondered why OS/2 didn't include a file manager, as I have, the answer is, it doesn't matter. FileStar/2 1.0 is here, the missing link has been found.

Geoffrey Hollander has been in the direct mail and mailing list business for many years and has been a regular contributing author for Mailer's Review, Home-Based Business News, Home Office Computing Magazine, Success Magazine, OS/2 Professional Magazine, and Personal Systems.

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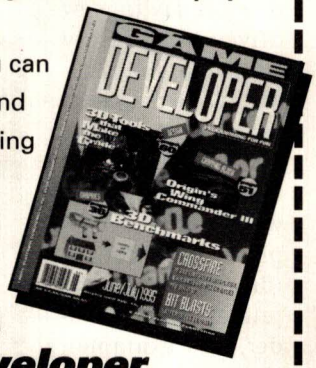

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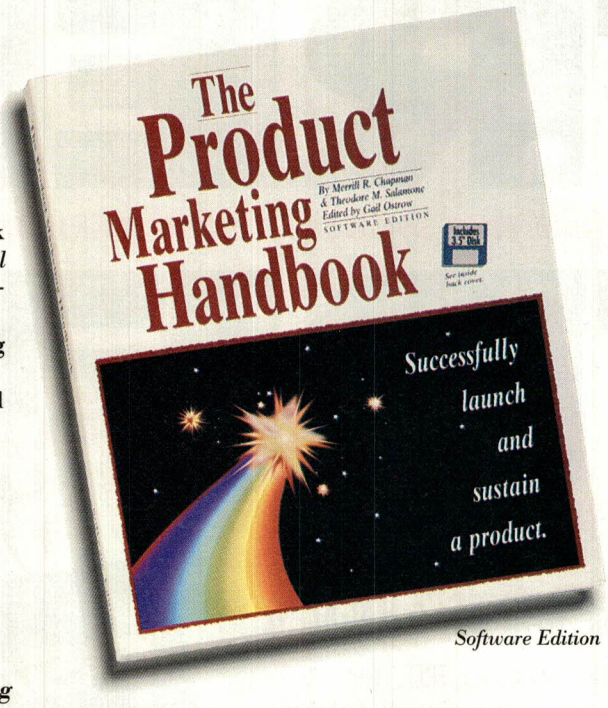
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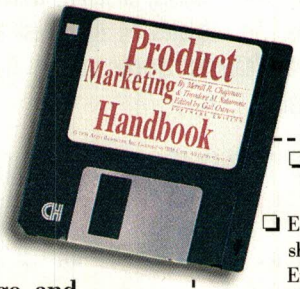

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Merrill R. Chapman has been in the software industry for 15 years and has seen firsthand the brilliant marketing techniques employed by industry giants and the catastrophic errors made by companies that are no longer in business. He presently consults with and trains marketing professionals in companies that include IBM, DataEase, SUN, Berlitz and WordPerfect.

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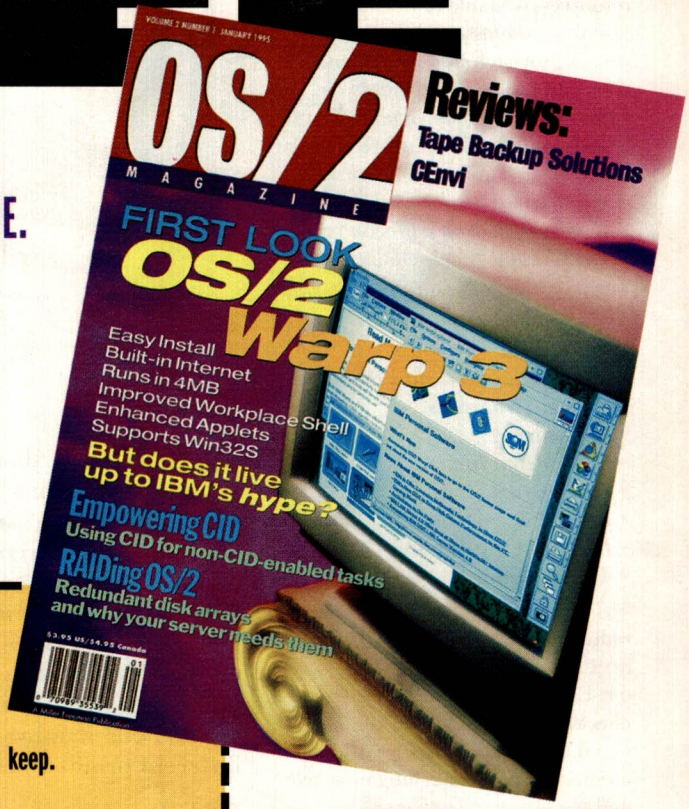

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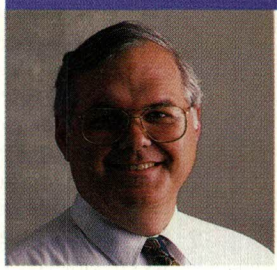


Groupware and OS/2

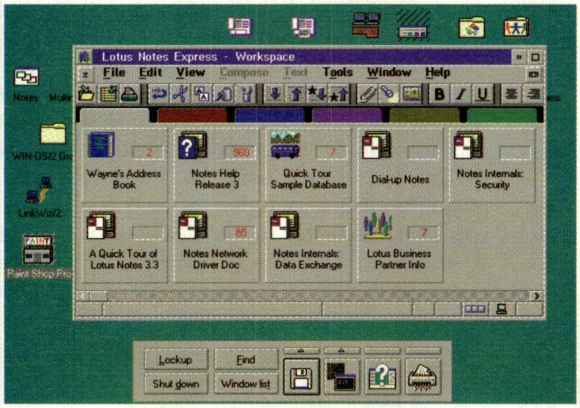
NOTES AND GROUPWISE AS A SERVER AND NOTES AS A CLIENT.

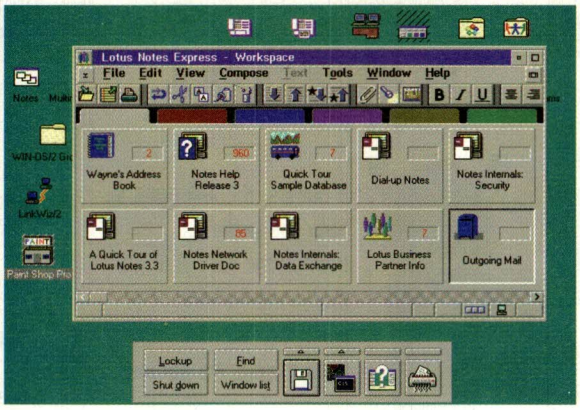
BY WAYNE RASH, JR.

At the press conference where he announced IBM's plans to acquire Lotus Development Corp., Chairman Louis Gerstner made it clear that the part of Lotus that IBM was most interested in was its groupware technology. This technology, embodied in Notes and cc:Mail, allows people to work together at a distance. Group-productivity software supports the formation of ad-hoc workgroups that, due to distance and time, could never have formed otherwise.

While much of the popular media is looking at groupware as if it were something new and different, this category of software has, in fact, been around for years and has supported OS/2 in one sense or another since the beginning. Interestingly, Notes isn't even the first groupware package, and while Lotus's product has helped define that part of the industry, plenty of activity is occuring in other areas.

Depending on who you ask, defining exactly what groupware is can be a little tough. Some people define groupware as any product that helps promote group interaction, including electronic mail. Others suggest that without support for applications development and access to databases, it's not truly groupware. While a generally accepted definition doesn't yet exist, it's safe to say that groupware is more than e-mail, but perhaps it doesn't need to be a dedicated development package.





Groping for groupware

The biggest reason IBM was willing to pay $3.5 billion for Lotus was almost certainly Notes. While Lotus has a suite of applications that run under OS/2 and a well-regarded e-mail package that also runs under OS/2, IBM apparently believed that Notes would be the next generation "killer app" that would give the company a significant technological edge. So, what is this thing called Notes and, more importantly, how does groupware fit into the OS/2 universe?

The key to Notes is that it centers around a database. Its heart can be either the series of databases that Lotus provides with Notes, another industry-standard database, or both. Everything in Notes works from its databases, whether it's Notes e-mail, Notes help files, or shared documents. Because of this data-centered design, Notes databases can be set up to allow members of a workgroup to share information and work together.

A shared document is a typial example of this ability. One member of a team might create the outline, while others fill in the contents. After the initial creation of the document, the team members can make editorial changes or add comments. It all takes place on a network, so the team members don't have to be located in the same place—they just have to be able to access the network.

The Notes design means that you can create a group productivity application that can do almost anything. While Notes includes some basic applications, such as e-mail, there's essentially no limit to what can be accomplished. All you have to do is program it.

Getting with the program

The problem is, of course, that not everyone wants to write programs for Notes or anything else. Fortunately,

however, Notes has been around long enough that a number of consultants who specialize in Notes programming have sprung up, and most of them are skilled in working with OS/2. The reason they have OS/2 skills is that the Notes Server originally ran on an OS/2 platform. While other platforms, including Microsoft Windows NT, have been added, OS/2 still has the lion's share of Notes servers.

Lotus isn't alone in this area. Novell, for example, features OS/2 support for its GroupWise message servers. Unlike Notes, GroupWise isn't specifically database centered. Instead, the Novell groupware product is based on a messaging model and what the company calls rules-based processing. Like Notes, that means that the product is essentially programmable and can be set to perform a number of functions beyond simple messaging.

Unfortunately, while GroupWise supports OS/2 for its server platform, it does not support OS/2 clients directly. Instead, the Novell solution uses Microsoft Windows clients that are designed to work well in an OS/2 environment. At this point, Lotus produces the only major groupware product that supports OS/2 clients.

Playing with notes

Fortunately, it's not hard to get your hands on Lotus Notes. Notes Express is included with OS/2 Warp Connect. This Lotus Notes client package can work with or without a Notes server. That means that in a smaller organization or department, you can exchange information between users without the management requirement of having to support a Notes database server.

The Notes Express software that is shipped with OS/2 Warp Connect includes several databases, including one for e-mail. Databases for documentation, news, and a company phone book are included, as well as a special database for shared discussions so that team members can consult with each other about the projects they're supporting with Notes. Lotus has also included a couple of databases that are exclusive to OS/2 Warp Connect users, a contact manager for tracking customers, and a customer-service database.

The inclusion of these databases means that Notes can be put to work right away in most organizations. They don't exploit the full power of Notes, but they are a good start and they'll help users learn what's possible.

The groupware deal

At this point, it's impossible to know whether IBM will win in its gamble and make its purchase of Lotus pay off. On one hand, Notes and related products, such as cc:Mail, are growing in acceptance with corporate customers. Likewise, a number of important trends, including a growth in telecommuting, staff downsizing, and higher productivity requirements, tend to support the idea that group productivity will gain greatly in importance.

Group productivity software allows executives to participate in team projects—even while they're traveling or working from home. That means that projects don't have to wait for critical team members to physically meet. Work continues, regardless of the location of the team members.

Of course, much of what groupware accomplishes can also be done with e-mail. The difference is that using e-mail becomes difficult when larger teams are involved. In addition, most companies are well along in their efforts to create robust communications infrastructures, which provide the platforms for such collaborative software.

In the meantime, groupware is already here and, in fact, has been around for some time. What's even better is that the means required to try it out are already included with OS/2 Warp Connect. Now all you need is your own group.

Wayne Rash, Jr. is a Contributing Editor and columnist for Communications Week. He's based in Washington DC and edits technology sections for The Washington Post. He can be reached at rash@access.digex.net or CompuServe 72205,221.

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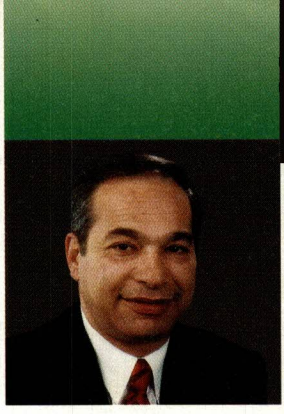


REXXUTIL Grows Up

NEW REXXUTIL FUNCTIONS

BY DICK GORAN

Much to my surprise, IBM has chosen to add new functions to REXXUTIL. I had previously thought that REXXUTIL was probably at its evolutionary end. The new functions that are planned are not of the earth-shaking variety nor do they provide any functions that have not previously been available via third-party Application Program Interfaces (APIs). A couple of the general-use functions, however, will be welcomed by most REXX programmers. All of the new functions are simply pass-throughs to the corresponding system functions that are referenceable in C only.

The advance information that I have obtained on these functions is preliminary and I can make no guarantee that all of the them will make it into the next official release of REXXUTIL, nor can I be certain that some additional functions won't be included in the next version of REXXUTIL. This new version is expected to be available with the next release of the OS/2 Developer Connection, which is expected by late August.

The new functions are grouped into seven categories: file system functions, mutually exclusive semaphore functions, event semaphore functions, process control functions, national language functions, macrospace functions, and function library routines. I have summarized the functions of each category in the following paragraphs and Table 1 contains a list of all of the functions.

File system functions

The **SysAddFileHandle()** and **SysSetFileHandle()** functions were implemented to overcome a "fix" that was made to OS/2 Warp (see April 1995, p. 54). These functions were added to allow the number of file handles to be adjusted for the current session, because OS/2 Warp reduced the default number of file handles per session to 20 (only 15 of which are available to a user program).

SysBootDrive() simply returns the letter of the boot drive (which I prefer to call the Initial Program Load or IPL drive) followed by a colon. This function serves an obvious need—it existed in the IBM internal version of REXXUTIL (*rxutil.dll*), but never made it into the released version until now.

SysFileSystemType() returns the name of the file system that is used on the specified drive. It will return FAT, HPFS, or presumably CDFS for valid drive designations. Otherwise, it returns a null string.

SysQueryEAList() allows you to retrieve a list of all of the extended attributes that are associated with a file or directory. You can then retrieve the specific EA data using the pre-existing **SysGetEA()** function. The list of EA names is placed in a compound variable.

SysWildCard() returns the result from editting a source file name with a wild-card mask. The editing is performed using **DosEditName()**.

Semaphore functions

Semaphores signal the beginning and ending of an operation and provide mutually exclusive ownership of resources. Typically, semaphores are used to prevent more than one process or thread within a process from accessing a resource. Semaphores are defined by the system and reside in an internal memory buffer. Semaphore names are validated by the file system and must include the prefix ***\SEM32***. Semaphores are divided into three types, according to the functionality they provide.

- Event semaphores enable a thread to notify waiting threads that an event has occurred.
- Mutual exclusion (**mutex**) semaphores enable threads to serialize their access to shared resources.
- Multiple Wait (**muxwait**) semaphores enable threads to wait for multiple events to occur or for multiple resources to become available.

The new **Mutex** and **Event** semaphores share the **SysCreate...()**, **SysOpen...()**, and **SysClose...()** function calls. Mutex handling is also permitted with **SysReleaseMutexSem()** and **SysRequestMutexSem()**, whereas the additional Event semaphore functions include **SysPostEventSem()**, **SysResetEventSem()**, and **SysWaitEventSem()**.

Process control functions

After many requests, the **SysShutDownSystem()** function has been added to the Process Control group to shutdown the OS/2 system from a REXX program. Session priority can be changed with **SysSetPriority**(*class, delta*) where *class* indicates the new process priority class. The allowed classes are as follows:

0 No change, leave as is.
1 Idle time priority
2 Regular priority
3 Time critical priority
4 Foreground server priority

Delta is the change that is applied to the process's priority level. The delta value must be in the range from -31 to +31.

SysProcessType() returns one of the following values that indicates the type of process that the REXX program is running in:

0 Full-screen protect-mode session.
1 Requires real mode.
2 VIO windowable protect mode session.
3 Presentation Manager protect-mode session.

4 Detached protect-mode process.

SysSwitchSession(*name*) causes the focus to be changed to the named session.

National language functions

The national language functions control the OS/2 code page settings and perform national language-sensitive operations, such as uppercasing and comparisons. The functions include: **SysGetCollate()**, **SysMapCase()**, **SysNationalLanguageCompare()**, **SysQueryProcessCodePage()**, and **SysSetProcessCodePage()**.

Macrospace functions

The macrospace can improve the performance of REXX procedures by maintaining REXX procedure images in memory for immediate load and execution. This ability is useful for frequently used procedures and functions, such as editor macros. Programs that are loaded and registered in the REXX macrospace are available to all processes. They can be called as functions or subroutines from other REXX programs just as other REXX external functions are called. However, the macrospace REXX procedures can be placed at the front or at the end of the external function search order using the **SysAddRexxMacro**(*name, file, [order]*). REXX procedures in the macrospace can be saved to a disk file using the **SysSaveRexxMacroSpace**(*file*). A saved macrospace file can be reloaded with the **SysLoadRexxMacroSpace** (*file*) function.

An application, such as an editor, can create a library of frequently used functions and load the library into the macrospace for fast access. Multiple macrospace libraries can be created and loaded. The other macrospace functions include: **SysClearRexxMacroSpace()**, **SysDropRexxMacro()**, **SysQueryRexxMacro()**, and **SysReorderRexxMacro()**.

According to the IBM-supplied REXX information, "the REXX macrospace is placed in shared memory. The size of the macrospace is only limited by the amount of memory and swap space available to the system. However, as the macrospace grows, it limits the memory available to other processes in the system. Allowing the macrospace to grow too large might degrade overall system performance due to increased system swap file access. It is recommended that only the most frequently used functions be placed in the macrospace."

Table 1: New REXXUTIL Functions.

```
File System Functions
     SysAddFileHandle()
     SysBootDrive()
     SysFileSystemType()
     SysQueryEAList()
     SysSetFileHandle()
     SysWildCard()

Mutex Semaphore Functions
     SysCloseMutexSem()
     SysCreateMutexSem()
     SysOpenMutexSem()
     SysReleaseMutexSem()
     SysRequestMutexSem()

Event Semaphore Functions
     SysCloseEventSem()
     SysCreateEventSem()
     SysOpenEventSem()
     SysPostEventSem()
     SysResetEventSem()
     SysWaitEventSem()

Process Control Functions
     SysProcessType()
     SysSetPriority()
     SysShutDownSystem()
     SysSwitchSession()

National Language Functions
     SysGetCollate()
     SysMapCase()
     SysNationalLanguageCom-
pare()
     SysQueryProcessCodePage()
     SysSetProcessCodePage()

Macro Space Functions
     SysAddRexxMacro()
     SysClearRexxMacroSpace()
     SysDropRexxMacro()
     SysLoadRexxMacroSpace()
     SysQueryRexxMacro()
     SysReorderRexxMacro()
     SysSaveRexxMacroSpace()

Function Library Routines
     SysDropLibrary()
     SysElapsedTime()
     SysLoadLibrary()
```

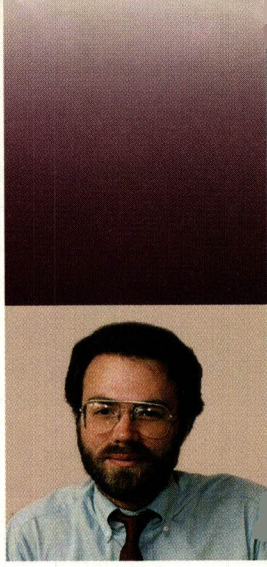
Function library routines

The function library routines include **SysLoadLibrary()** and **SysDropLibrary()**. They assist in the loading and dropping of REXX external function libraries. They have extended flexibility over the built-in functions **RxFuncAdd()** and **RxFuncDrop()** because they include the ability to reference ordinal routines within a *.dll*. If a load routine is not specified, **SysLoadLibrary()** will call ordinal routine #1 in the DLL. Similarly, if the name of the routine to be dropped is not specified, **SysDropLibrary()** will call ordinal routine #2 in the *.dll*.

SysElapsedTime(*option* **)** uses the first letter of the following strings. **Elapsed** returns the number of seconds and microseconds since the elapsed time clock was started or reset. It is the default. **Reset** returns the number of seconds and microseconds since the elapsed time clock was started or reset and also simultaneously resets the elapsed time clock to zero. The value returned will be in the same format as the **TIME(** *'E'* **)** built-in function **ssssssss.uuuuuu**. The number will have no leading zeros or blanks. The fractional part will always have six digits.

SysElapsedTime() reports an elapsed time using the OS/2 high-frequency timer services. The high-frequency timer services have a higher timer resolution than the timer services that are used by the **TIME()** built-in function. **SysElapsedTime()** maintains a single process-wide time stamp for measuring elapsed time. In contrast with the **TIME()** built-in function, the time stamp is not saved and restored on subroutine calls and multiple calls to **SysElapsedTime()**. A single instruction will use different versions of the time stamp.

Dick Goran is the author of the REXX Reference Summary Handbook, Third Edition. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients and lectures on OS/2. His free REXX utility programs can be downloaded from OS2DF1, lib 6 on CompuServe or ftped from ftp.cfsrexx.com /pub. He can be reached via e-mail at 71154.2002@compuserve.com.



Cross-eyed about Cross-Linked Files

UNDERSTANDING FAT CLUSTERS AND CHKDSK ERRORS.

BY MARK MINASI

If you're a dual-booter, as many of us OS/2 users are, you know that switching from DOS back to OS/2 often causes a raft of bad news to appear on your screen, for example "such and such file is cross-linked on cluster 802," "16384 bytes found in lost clusters," or "file XXX allocation error, size adjusted." What are those messages all about, what can you do about them, and how can you avoid them in the first place?

Those messages are generated by an old companion, a program that's been around since DOS 1.0, a program named **chkdsk**, or rather a more recent avatar of that program. You can still activate **chkdsk** from the command line under OS/2, but often you don't need to because you can opt to run it automatically at boot time. But, what exactly is a lost cluster, a cross-linked cluster, or an allocation unit? They are part of OS/2's most-used file system, the File Allocation Table (FAT).

The FAT file system uses two components to keep track of files on your disk: a directory, which keeps track of what files are on your disk, and a File Allocation Table, a structure that keeps track of what each part of the disk is doing. The disk is divided into areas between 2K and 32K in size that are called clusters, which is what the FAT keeps track of. Each cluster on a disk is allocated to a file. Clusters can't be shared between files, so even if a file is smaller than a cluster, the whole cluster gets allocated to the file. The FAT sees every cluster as unused and available, part of a file, or "bad," meaning that it has some kind of problem retaining data and should be ignored.

The FAT is, eponymously, a table with one entry for each cluster on the disk. FAT table entry number 310, for example, describes cluster 310 in some way. If FAT entry 310 contains the value "free," cluster 310 is free and OS/2 can use it when a program wants to create a new file. If FAT entry 310 contains the value "bad," OS/2 knows never to use that cluster. Alternatively, if the FAT entry contains a number, that means that the corresponding cluster is part of a file. The number is simply a pointer to the next cluster in the file. For example, if cluster 310 contains the value "311," that instructs OS/2 that cluster 310 is part of a file and that cluster 311 is the next cluster that contains the file.

It is essential, in understanding FAT, to know how the directory works. Directory entries contain everything you're used to seeing when you do a **DIR** command: file name, date, time, and file size, with a few other items as well, most important of which is the number of the initial cluster.

To locate a file on a FAT-based disk, therefore, OS/2 first reads the file's directory entry, which tells it the file's size, from which the number of clusters in the file can be calculated, and the location of the file's first cluster. OS/2 then uses the file's first cluster number, looking up that entry in the FAT. The first cluster's entry in the FAT contains the cluster number of the second cluster of the file. By looking at the FAT entry for the second cluster of the file, OS/2 finds the cluster number of the third cluster of the file, and so on. Finally, the FAT entry for the last cluster of the file contains an end-of-file (EOF) flag.

For example, if OS/2 looks up a file that is called *letter.doc* on a disk with clusters that are 2K in size, imagine that OS/2 first looks in the directory entry for *letter.doc* and finds that it is 9K in size. It is, therefore, five clusters in length and starts at cluster 2511. OS/2 then looks, for example, in the FAT at table entry 2511, finding 2512. OS/2 now knows that *letter.doc* is five clusters long and the first two clusters that the file is in are 2511 and 2512. To find the location of the third file cluster, OS/2 looks in the FAT entry for the second cluster and finds the value 3279 in the FAT entry. That means that the first three clusters of the file are 2511, 2512, and 3279. This break in sequence between 2512 and 3279 means that the file is noncontiguous. If FAT entry 3279 contains 3280 and FAT entry 3280 contains 3281, OS/2 knows that the letter is in clusters 2511, 2512, 3279, 3280, and 3281. The process could stop there, but it doesn't. Just as a check, OS/2 looks in the FAT entry for cluster 3281. It contains an EOF marker, just as it should, signifying that all is well.

That's how healthy files are laid out. But, the FAT system can break down (into simple lipids, one imagines—sorry, that's an Organic Chemistry joke) in a number of ways. First, what if OS/2 expected four clusters, but found a chain of clusters that contain 2511, 2512, 3279, 3280, and 3281? Or, what if OS/2 expected six clusters, but found only the five? Or, what if OS/2 looked in FAT entry 3279, found the value 3280, and looked in FAT entry 3280, but found that it was marked "free?" That would mean that 3279 thought 3280 was part of the file, but 3280 thought

that it was free and unallocated.

In either case, you'd have an allocation error. They're usually caused by an interruption in a file write. If you boot from the OS/2 Installation disk and OS/2 Disk 1, you'll see the opening screen—don't press <Enter>, press <Esc>. You'll get an **A:\>** prompt. Insert a disk that contains *chkdsk.com,* type **chkdsk c: /f**, and press <Enter>. **Chkdsk** will note that a file had an allocation error and you will see the comment "size adjusted." **CHKDSK** will simply look at the number of clusters that are allocated to the file, multiply it by the size of a cluster, and set the file size to that value.

Now, suppose you've got a chain of FAT entries that looks fine: one cluster leads to another, which leads to another, and so on, ending finally with an "EOF" marker. All looks good until you realize that it has no directory entry pointing to the chain. It is, in essence, a file without a directory entry—kind of a file with no name. **CHKDSK** calls this chain of clusters a group of lost clusters. **CHKDSK** offers to fix that by marking all of the FAT entries "available," which frees up the space, or it simply adds a name to the file, such as *file0000.chk*.

Clusters are lost because writing the directory entry is one of the last things that ever happens when a file gets written out. When a program is interrupted in the middle of writing a file, the disk might contain the changes to the FAT, but not the directory. The result is a set of lost clusters. Where do these "interruptions" come from? They can result from someone turning off the computer in the middle of a disk operation (always do a shutdown before powering off!) or it could be due to a faulty piece of software.

Finally, what happens if two FAT chains point to the same place? If one FAT chain runs from cluster 735 to 736 to 737 that contains an EOF, but another chain runs from 500 to 501 to 736, which goes, again, to 737 and an EOF, two different files both claim clusters 736 and 737—a FAT no-no. Unfortunately, because both files think they own these clusters, one of them must be wrong. That means that one file is attempting to append useless information to its end (which means that you haven't lost anything) or that part of a file has been lost and nothing can be done about it. The remedy is simple. Simply copy both files to other names and erase the originals. For example, if **CHKDSK** reports that "*abc.txt* is cross-linked on cluster 873," and later reports that "*xyz.txt* is cross-linked on cluster 873," ABC and XYZ are cross-linked with one another. Copy *xyz.txt* to another file, such as *xyz1.txt*, and copy *abc.txt* to, for example, *abc1.txt* and erase *abc.txt* and *xyz.txt*. Then, check both files to see if any extra information has been attached to one of the files. If so, simply delete the excess garbage.

Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for Compute, BYTE, and OS/2 Magazine. You can contact him at CompuServe 71571,264 or Internet mark@smtphost.mmco.com.

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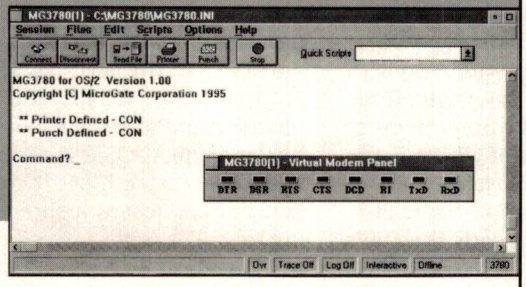
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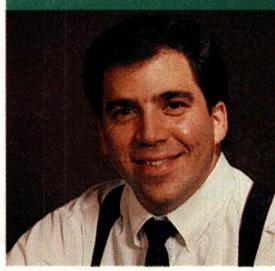

Calling for Help!

IBM'S SUPPORT-LINE PROCESS, TRAP SCREENS, COPYING EXTENDED ATTRIBUTES, AND MORE. . . BY DAVID REICH

MORE ON HELP

In the June 1995 issue (p. 68), I wrote about turning off the help prompt that appears at the top of command-prompt sessions. I was responding to a question from a reader and took the short-term solution. As many readers have since pointed out to me, if one wishes to permanently remove the help line, it can be done by editing the *config.sys* file.

To permanently remove the help line from your command prompts, edit *config.sys* and look for the line that reads:

```
SET PROMPT=$i[$p]
```

Remove the $i from the line. The $i is the prompt command sequence that turns on the help line. By removing it and rebooting your system, command prompts will no longer include the help line.

MINIMIZE ON START

In June, I also addressed the topic of starting programs minimized. I wrote that Presentation Manager graphics programs have the ability to ignore messages that the shell sends them on startup, such as the message to minimize, and respond based on the programmer's choices. Such choices might include size upon shutdown, always starting maximized, and so on. For this reason, the Workplace Shell developers have greyed out and disabled the Start Minimized checkbox in the Settings Notebook for PM programs. I've received quite a few e-mail messages informing me of a way to "fake out" the Settings Notebook to force it to try to send the minimize message to a PM program.

As you know, the Start Minimized checkbox in the Settings Notebook is unchecked and disabled for PM programs. To set it to checked, open the Settings Notebook with a right click on the program-reference object and left click on Settings. If you go to the Session page, you'll notice that you cannot alter the Start Minimized checkbox. Now, move to the Program page. In the path and program file name area, go to the end of the program name and take the **e** off of the end of *.exe* and press the <Tab> key, so that the shell no longer refers to the real program executable file, referring, instead, to a non-existant entity. By completing these steps, you prevent it from knowing that you have a PM program.

Next, go back to the Session page and check the Start Minimized box. Go back to the Program page and fix the program path and file name from which you removed the **e**. Once the check box is checked, the shell will send a minimize message to the program when it starts.

You should note that PM programs do not necessarily respond to this message. However, in many cases, application developers have not programmed "around" it, so it might actually work. It seems to work in a large number of cases, according to the readers who sent this solution to me, so it's worth a try and, even if it does not work, it doesn't damage anything.

CALLING FOR HELP

Q: What's the best way to contact IBM OS/2 Support to have questions and problems addressed quickly?

A: The Support Line number can be found inside the "Using the Operating System" manual, along with your registration number. You can receive free support for the first 60 days after your first call. When calling, you should have as much information ready about your system as possible, such as the make and model of your computer, including processor (for example, 25MHz 386SX and so on), BIOS manufacturer (such as AMI or Phoenix)and level, the amount of memory you have installed, the hard disk type (such as SCSI or IDE) and its size, the video card, the amount of video memory, and the type of monitor. Most, if not all of this information can be obtained from system diagnostics programs or from the information that is displayed when you first turn on your computer. The first questions you'll be asked refer to this information. The greater the level of detail you can provide, the better—especially if you've modified your system from the manufacturer's standards with, for example, a 486 processor upgrade card, a new video card, or disk controller.

Next, of course, you should have your questions ready. You should know the application(s) you are using with the version and mode (OS/2, DOS, or Windows). Make sure you understand the software and what it does to

your system, especially programs that may load device drivers, such as MIDI.

If you are reporting a problem that you are having with the operating system, the most vital piece of information is the complete problem recreation scenario. If it was a one-time problem, not much can be done about it unless someone else was able to see it more regularly and IBM developed a fix for it. That does not mean that you shouldn't call it in, but unless they have something to debug, not much can be done about it.

ANSWERS FROM OS/2 SUPPORT

Q: How does the IBM OS/2 Support process work? What can I expect when I call?

A: Once you have been greeted by a representative and you have supplied the basic information, your call will be routed to a team that specializes in the type of problem or question you have. They will do their best to answer your question or, if you are having a problem that appears to be a bug in OS/2, they will gather more detailed information and pass it on to an analyst who will work to debug the problem and get you a solution. Eleven of these teams exist in the following categories:

- disk
- DOS applications
- hang/trap
- install
- mouse/keyboard/communications (MKBCM)
- multimedia (MMPM)
- print, video
- Windows
- applications
- Workplace Shell
- other

The purposes of most of these teams are self-explanatory. A couple, however, require some explanation. The Hang/Trap team specializes in diagnosing and solving problems that cause hangs in the system or that trap and cause pop-up windows, such as SYS3175, to appear. The Other team is somewhat of a grass catcher, in that they handle all types of questions and problems that don't fit into the other categories. The Other team might handle, for example, system performance issues. It is generally best if questions about programming topics are directed to the appropriate team. For example, if you are having problems with Workplace Shell programming, the Workplace Shell team is the place to direct your question.

When you talk to the first support person who takes your information, you should ask that your call be directed to the team you feel would best suit your problem. The support representative who takes the initial information is responsible for routing the call to the appropriate team, but they can't be expected to be perfect. They decide which is the right team based on one or two sentences. If you can direct them, you will make it easier on them and you will be more likely to receive a speedy answer.

SYS1276

Q: I typed the following:

```
format e: /fs:hpfs
```

and the system gave me a SYS1276 error that says that I typed an incorrect parameter for the command. When I looked at the command reference, it looked just fine. What's wrong?

A: You are definitely correct that nothing is wrong with what you typed. The most likely cause of this error is that you have not installed HPFS. If you're brave enough to mess around in your *config.sys* file, look to see if the ifs= line specifies hpfs.ifs. You will find it near the top of your *config.sys* file. If it is not there, you can manually add it or go into Selective Install in the System Setup folder that is located in the OS/2 System folder and selectively install HPFS support. Then, reboot and retry the command.

DECIPHERING TRAPS

Q: What are all of those things on a trap screen and what do they mean?

A: Early in OS/2's history, trap screens were only displayed in full-screen sessions. Depending on the trap, one might not be able to print it or easily capture the information in it. Not only that, but the information that was displayed was cryptic and users could not figure out what was going wrong with their system. Over time, changes were made to enhance trap screens' readability as well as their functionality. The fundamental information, however, has not changed much. The most significant visual change is that most traps are now displayed in a window, instead of popping over to a full screen. The only traps that are still displayed in full-screen mode are those that cause the system to halt immediately. The reason is that if the error is severe enough to bring the system down, such as a loss of all virtual memory, the system is no longer reliable enough to display a graphical window.

The contents of a trap window are intended to inform the user about what has trapped (which, in general, caused some protection exception or attempted to execute some type of illegal instruction), and why the trap happened. The first part of the trap window contains the system-error number, such as SYS3175. You can obtain more information about the error by typing **help SYS3175** (or whatever error number is in the window) and <Enter> at a command prompt. This action will prompt more background information about the error.

You will also be able to see what the name of the program that trapped was. In some cases, the name is the program name, for example, *myprog.exe*. In some cases, you will see the name of a system library, such as *som.dll* or *doscalls.dll*. The system can only report the location of the code that is failing. It might be a system library, but that does not always indicate a system error. What it means is that some program sent some invalid information to a system library and the library routine tried to use it and failed.

The cryptic numbers and letters that you will see after this information is displayed are only useful to programmers. This data includes the registers and their values as well as addresses and other information that will point programmers toward the location of the error. This is another type of information you need when you report a problem to OS/2 support.

STOPPING POP-UPS

Q: I have a server that I keep in a closet because we never actually have to work with it. Even though I know what the pop-ups are, I don't want them to show up on my server system, because no one will see them. Can I stop the pop-ups from showing up?

A: You can insert a line into your config.sys file that will stop the pop-ups from showing on the screen and log the information to a file on your hard disk. Edit your config.sys file and add in the line:

```
SUPPRESSPOPUPS=C
```

You can replace the C with any valid hard-disk drive letter that is not a networked drive. After you reboot your system, all traps will be logged to a file on the specified drive instead of showing as pop-ups or windows on the screen.

COPYING EAs

Q: I just finished using xcopy to copy all files from one drive to a new and larger drive. All of the files were copied successfully except *ea data. sf*. How can I copy this file? I already tried to copy it by booting with OS/2 installation disks. In addition, I tried to boot to DOS to do the copy and tried xcopy as well as copy. I ran the desktop backup procedure that is documented in the IBM manual, so I'm not worried about losing desktop information, but I thought *ea data. sf* was the main extended-attribute file. How can I move all of OS/2 from one drive to another, including *ea data. sf*?

A: What you are trying to do is called cloning the installation. In general, that is not a good thing to do. If you are doing so for backup or archive purposes for the same machine, you should have no problem. But, it is important that you don't try to move the installation to another machine, because OS/2 reads the hardware during installation and changes things for each system. Cloning a drive for another machine will almost always create problems.

If I can assume that you are only backing up for archival purposes, you should know that xcopy is only a bulk copy routine. Essentially, it copies files. Because *ea data. sf* is a special file that holds the extended attributes on FAT drives, you actually have no reason to copy it, because things may change on the new system. If you are using xcopy, the file system copies the file as if you were using the copy command and also copies the extended attributes for the file. If the target drive is also FAT-formatted, the system will copy the EAs to the new drive, putting the EAs in *ea data. sf* on that drive. If the target drive is HPFS-formatted, the EAs will be placed in the EA structures in the HPFS file system.

The bottom line is, if you are xcopying one drive to another, you don't need to worry about the *ea data. sf* file.

ALLOCATION UNITS

Q: I need information about space allocation, block sizes, and so on for HPFS and FAT partitions. Are FAT partition disk blocks larger than HPFS blocks? For example, if I save a one-byte file, will it consume more physical space on a FAT partition than on an HPFS?

A: HPFS allocations are always in increments of 512 bytes. The FAT file system has a maximum of 64K allocation units. So, if you take your partition size and divide it by 64K, you will find your approximate allocation size. This size will almost always be larger on FAT than on HPFS, so sizes are almost always more efficient on HPFS if you tend to store many files that are not close to the allocation unit size.

David Reich, a contributing editor to OS/2 Magazine and author of Designing High-Performance OS/2 Warp Applications, has been with the OS/2 development team since 1987. David is interested in your questions and suggestions. Contact him at CompuServe 76711,632 or Internet speedracer@bocaraton.ibm.com.

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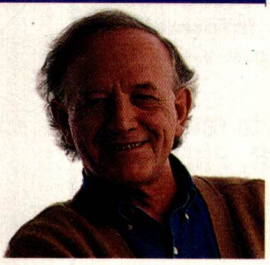

REXX Dishes Fit for a King

THE REXX COOKBOOK

BY STAN KELLY-BOOTLE

After the recent spate of OS/2 "bibles" and general reference works, it's a pleasure to review an OS/2 book that is dedicated to a specific programming language: Merrill Callaway's *The REXX Cookbook* from Whitestone. The author and publisher of this book offer reassuring credentials that merit the patronage of the OS/2 community. Callaway is a member of the original REXX Language Association steering committee and an active supporter of IBM's Developer Assistance Program and DevCon. Whitestone is a member in good standing of IBM's Independent Vendor League and the book itself (hardly a surprise) carries the OS/2 Accredited escutcheon (billet of roundels rampant in *gules*, azure, *or*, *gris*, and *vert*).

For the millions of newcomers to OS/2, I should perhaps preface my review with a brief introduction to REXX, a somewhat belabored acronym for REstructured eXtended eXecutor. It emerged from IBM UK in the early 1980s and quickly became IBM's procedural language of choice for the Systems Application Architecture (SAA). Two factors make REXX a useful language to add to your repertoire. First, the SAA pedigree ensures a high degree of REXX portability across diverse IBM platforms, from mainframe to PC and all intermediate stations. Second, a REXX interpreter comes bundled with OS/2, so you can launch REXX programs from the OS/2 Command Window with no messy preliminaries. The language is extremely modular and extensible and is particularly popular for rapid prototyping. You can use REXX for simple batch-type jobs as well as complex industrial-strength applications, as is demonstrated monthly in *OS/2 Magazine* by our own REXXpert, Dick Goran. The *rexxutil.dll*, for example, which is supplied with OS/2, provides a powerful library of routines for launching OS/2 tasks. In addition, many third-party REXX products are available, such as Watcom's VX-REXX or HockWare's VisPro REXX for building PM applications.

As the title suggests, Callaway's book is a practical just-do-it tutorial. Just like the Galloping Gourmet, the author rushes you into the kitchen, rattling them pots and pans. Real meals start turning up with graduated complexity, cleverly paced to nurse you past REXX's famous quirks. By Chapter 8, we have moved to the meaty topics of macros and application command sets. Then, we move on to queues and Inter-process controls (IPCs) in Chapter 9, including some nice DB2/2 SQL examples. Chapter 10 covers VX-REXX and event-driven GUI programs. The book ends with an intriguing look at PostScript programming under REXX, one of the many guilt-provoking lacunae that I intend, one day, to fill.

The author digresses at appropriate moments, exploiting **REXXTRY** (the interactive REXX command) to delve into matters syntactical. However, as Callaway points out, a cookbook is no substitute for those formal language reference manuals that painstakingly exegete each semicolon. Rather, his book complements such standard references as *The REXX Language* (Prentice Hall) by Michael F. Cowlishaw, the original author of REXX, and the *REXX Reference Summary Handbook—Third Edition* (C F S Nevada) by Dick Goran, our own esteemed REXX columnist.

The *REXX Cookbook* is a tad unusual in offering you three purchase options. You can buy the book for $27.95, the disk for $14.95, or the combined book-disk for $42.90. A little REXX programming reveals that the combo price offers no financial inducement, which I feel is a marketing mistake. The disk, by the way, contains several programs that are not included in the book.

The REXX Cookbook is commendably and tirelessly enthusiastic. I was initially put off by Callaway's chattiness until I got past the bits I was familiar with. Then, I began to appreciate his expository skills—the little detours and the way he occasionally repeats or paraphrases an earlier point. I am less happy with the fussy typography—whom to blame for the disconcerting abundance of bold caps? Author, publisher, REXX, or PostScript?

Those looking for a better organized, more readable REXX programming tutorial should consider *Teach Yourself REXX in 21 Days* by Bill and Esther Schindler (SAMS Publishing, $29.99), which was strongly recommended by Dick Goran (August 1995, p. 62).

RESOURCES:

***The REXX Cookbook—A Tutorial Guide to the REXX Language in OS/2 Warp on the IBM Personal Computer* ($27.95)**
by Merrill Callaway
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Stan Kelly-Bootle started computing on EDSAC I at Cambridge more than 40 years ago and has written at least 11 books. His "Devil's Advocate" column in UNIX Review has been running since 1984. His latest book is The Computer Contradictionary (MIT Press, 1995). He welcomes e-mail via CompuServe 70323,1560, Internet skb@crl.com, or S.KBOOTLE on AppleLink.

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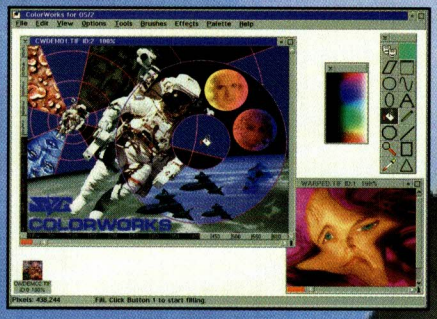

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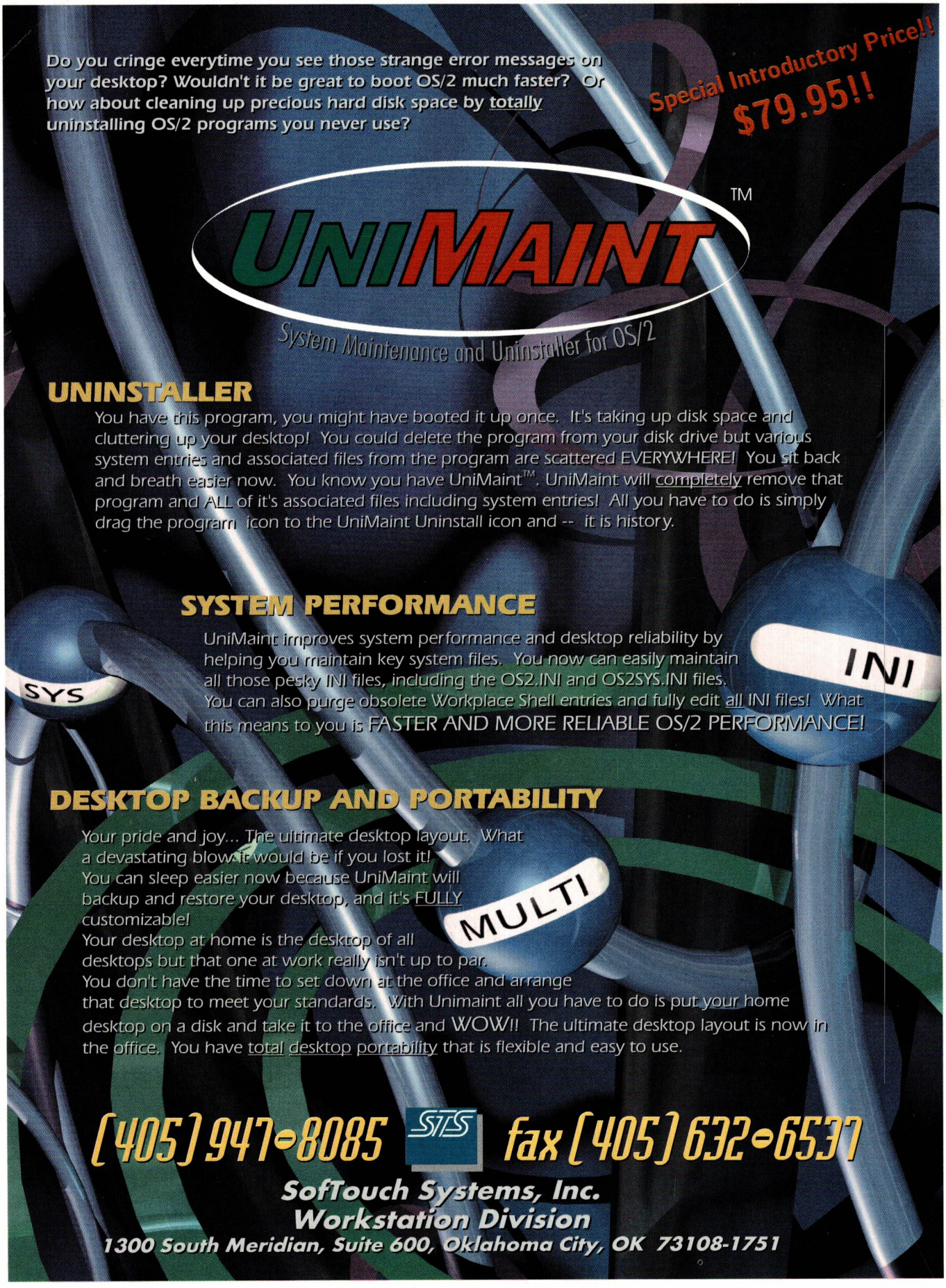
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